MEASUREMENT/TECHNICAL REPORT
FCC Part 15 Subpart C

Issued: February 13th, 2008

Name and Address of the Applicant:	SATO Corporation 1-207, Onari-cho, Omiya-ku, Saitama-shi, Saitama-ken 330-0852, Japan
Test Item:	Bluetooth Adapter
Identification:	CT-BT1
Serial No.:	None
Sample No.:	1
FCC ID:	MMFCT-BT1VIPER
Sample Receipt Date:	November 9, 2007
Test Specification:	CFR 47 Part 15 Subpart C 15.247
Date of Testing:	November 26th - February 5th, 2008
Test Result:	PASS

Report Prepared by:	Cosmos Corporation 2-3571 Ohnogi, Watarai-cho, Watarai-gun, Mie, Japan 516-2102 Phone: +81-596-63-0707 Fax: +81-596-63-0777

Tested by: M. Yamanaka, Engineer — February 13th, 2008 (Date)

Reviewed by: Y. Kawahara, Deputy General Manager — February 13th, 2008 (Date)

Notes:

1. This report should not be reproduced except in full, without the written approval of Cosmos Corporation.
2. All measurement data contained in this report may have uncertainty. A judgment for the limitation should be taken into the count.
3. The report in this report apply only to the sample tested.

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1. Description of Equipment Under Test

1.1 Product Description

Manufacturer : SATO Corporation
Model (referred to as the EUT) : CT-BT1
Nominal Voltage : DC 5V
Type of Modulation : FHSS
Mode of Operation : ☐ duplex ☐ 1/2 duplex ☐ simplex ☒ other
The type of the equipment : ☐ Stand-alone ☐ Combined Equipment
☐ Plug –In Card ☒ Other (Module Unit)
The type of the antenna : ☒ Integral ☐ external ☐ Other
The type of power source : ☐ AC mains ☐ Dedicated AC adapter (V)
☒ DC Voltage ☐ Battery
The type of battery (if applicable) : N/A
Type of Operation : ☐ Continuous ☐ Burst ☒ Intermittent
Stand by Mode : ☐ Available ☒ N/A
Intended functions : Wireless data transmission.
The bandwidth of the IF filters : N/A
Method of Communication Link : Software to make maximum speed transmitting
The operating frequency band : 2.400 – 2.483.5MHz
The thermal limitation : Not specified

1.2 Antenna Description

No.	Type Name	Gain	Antenna Type	Remarks
1	AH104F245001-T	+2dB	Multilayer	---

1.3 Accompanied Peripherals Description

The following equipment is accompanied with EUT as its peripheral.

No.	Equipment Name	Manufacturer	Type Name	Serial Number	Remarks
1	Personal Computer	HP	HSTNN-105C	CNU7130K2P	DC 18.5V, 3.5A
2	AC Adapter	DELL	PA-1650-02HC	7213472701	AC 100-240V, 1.6A
3	REGULATED DC POWER SUPPLY	Kikusui Electronics Corp.	PAN60-10A	HC000143	AC100-230V

2. General Information

2.1 Test Methodology

All measurement subject to the present report was carried out according to the procedures in ANSI C63.4: 2003.

2.2 Test Facility

All measurement was performed in the following facility;

Cosmos Corporation EMC Lab. Ohnogi

(2-3571 Ohaza-iwatachi, Ohnogi, Watarai-cho, Watarai-gun, Mie-ken 516-2102, Japan) The test firm has been filed since November 2, 2004 under CFR 47 Part.2.948.

2.3 Traceability

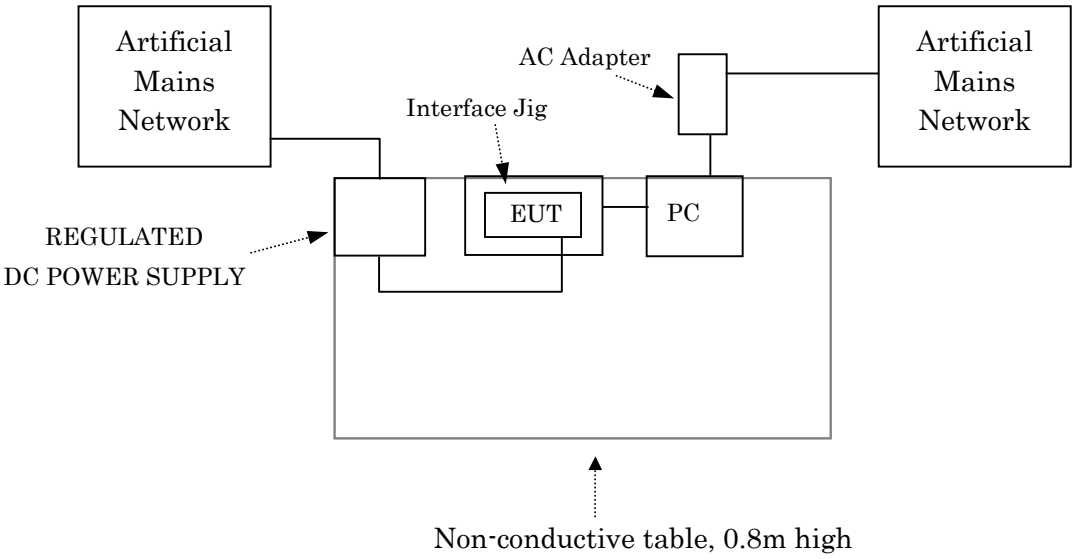
The calibration of measurement equipment used in the test subject to the present report is designed and operated to ensure that the measurement is traceable to national standards of measurement or equivalent abroad.

3. Summary of Test Results

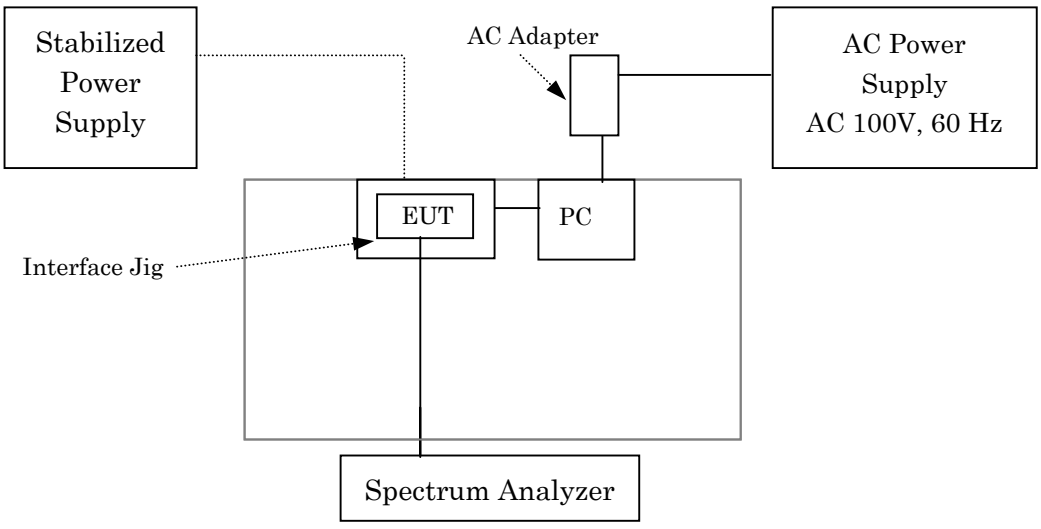
Section	Test Item	Limit	Result
15. 207	AC Power Conducted Emission	See 5.1.2	Pass
15. 247(a)(1)	Spectrum Bandwidth of Frequency Hopping Spread Spectrum System	< 1MHz if using less than 15 non-overlapping channels	Pass
15. 247(a)(1)	Channel Separation	> 2/3 of 20dB BW for systems with output power < 125mW	Pass
15. 247(a)(1)	Number of Channels	> 15 channels	Pass
15. 247(a)(1)	Time of Occupancy	< 0.4 sec in 30 sec period	Pass
15. 247(b)	Maximum Peak Output Power	Max. 30dBm	Pass
15. 247(d)	Transmitter Spurious Emissions (Conducted)	20dB less than the peak value	Pass
15.209 15.247 (d)	Transmitter Spurious Emissions (Radiated)	Limit : 15.209	Pass
15. 247(d)	Band Edge Measurement	See 5.7.2	Pass

4. Test Configuration

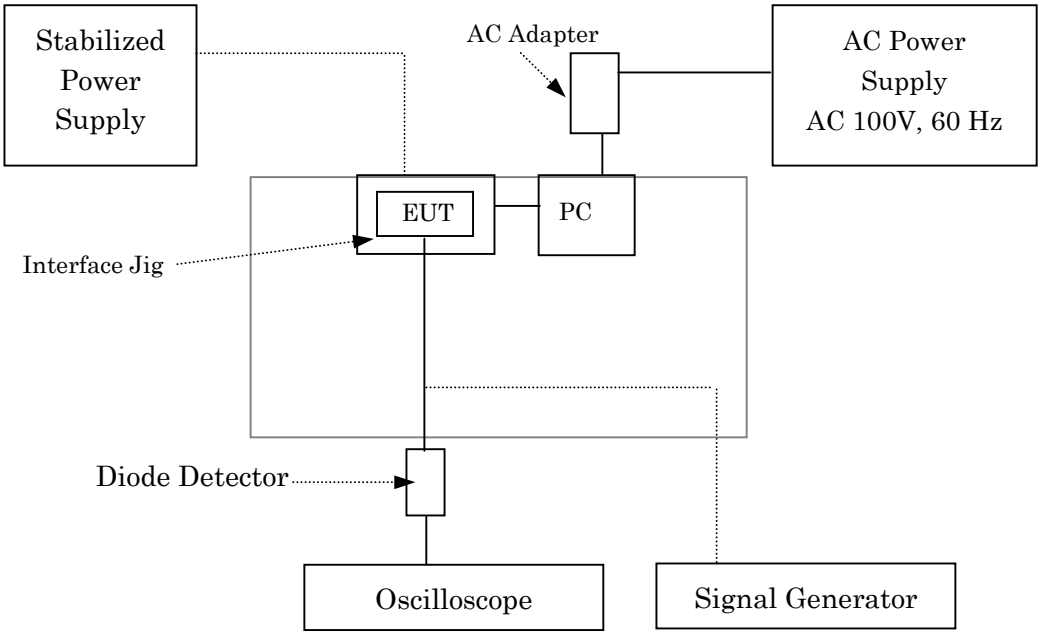
4.1 15. 207 AC Power Conducted Emission in Shield Room



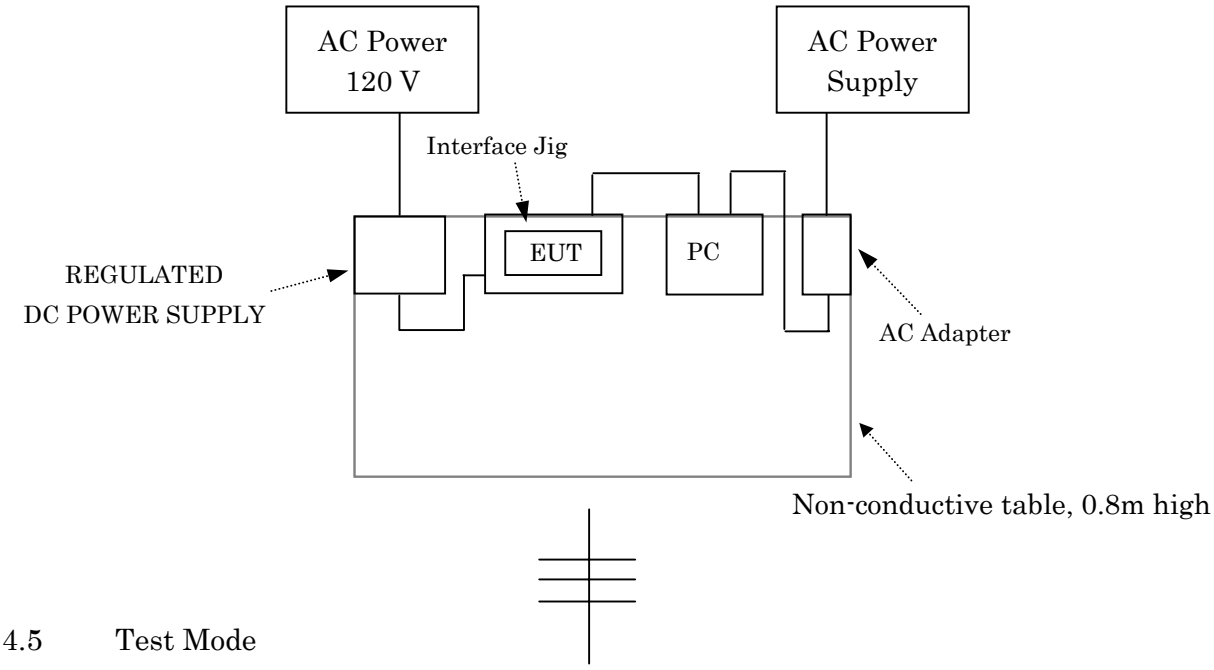
4.2 All Other Test Items



4.3 Maximum Peak Output Power



4.4 Radiated Spurious Emissions



4.5 Test Mode

In all test configurations above, EUT makes continuous RF transmitting with maximum power.

All conducted measurement is performed with an external stabilized power supply voltage varied between 85% and 115% of the nominal rated supply voltage in accordance with the section 15.31 (e) of the part.

5. Measurement Result

5.1 15. 207 AC Power Conducted Emission

5.1.1 Setting Remarks

- Configure the EUT System in accordance with ANSI C63.4-2003.
- A wooden test table (1.5m×1.0m, height 0.8m) is used.
- EUT's dedicated AC adapter connected to line impedance stabilization network (LISN).
- Other power cord of support equipment is connected to another LISN to isolate its emission from the measured emission of EUT.
- The measuring port of LISN for support equipment is terminated by the 50Ω
- Activate the EUT System and run the software prepared for the test, if necessary.
- See test configuration figure 4.1.

5.1.2 Minimum Standard

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

5.1.3 Result

EUT complies with the requirement.

Uncertainty of measurement : ± 2.26 dB
Temperature, Humidity : 23˚C, 45%

5.1.4 Measured Data

Measured Value Table

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V,60Hz

Job No : CJ07-064224E
Temp/Humi : 23°C/45%
Condition : Operated CH:39 (2441MHz)
Remark :

Memo : RBW:9kHz(150k-30MHz)

LIMIT : FCC 15.207(QP)
FCC 15.207(AV)

No	Freq.	Reading Level		C.Fac	Results		Limit		Margin		Phase	Comment
		QP	AV		QP	AV	QP	AV	QP	AV		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0	2.11360	24.9	17.8	10.1	35.0	27.9	56.0	46.0	21.0	18.1	La	
0	2.57260	22.5	17.4	10.2	32.7	27.6	56.0	46.0	23.3	18.4	La	
0	2.59170	24.6	19.6	10.2	34.8	29.8	56.0	46.0	21.2	16.2	La	
0	4.18400	37.0	30.0	10.2	47.2	40.2	56.0	46.0	8.8	5.8	La	
0	5.83980	23.5	16.4	10.4	33.9	26.8	60.0	50.0	26.1	23.2	La	
0	20.16170	19.6	11.3	11.1	30.7	22.4	60.0	50.0	29.3	27.6	La	
1	1.99570	25.4	20.2	10.1	35.5	30.3	56.0	46.0	20.5	15.7	Lb	
2	2.46070	27.7	21.0	10.1	37.8	31.1	56.0	46.0	18.2	14.9	Lb	
3	2.72640	27.5	20.2	10.2	37.7	30.4	56.0	46.0	18.3	15.6	Lb	
4	4.18400	36.9	29.8	10.2	47.1	40.0	56.0	46.0	8.9	6.0	Lb	
5	5.78370	23.3	13.9	10.4	33.7	24.3	60.0	50.0	26.3	25.7	Lb	
6	20.00720	20.0	12.1	11.0	31.0	23.1	60.0	50.0	29.0	26.9	Lb	

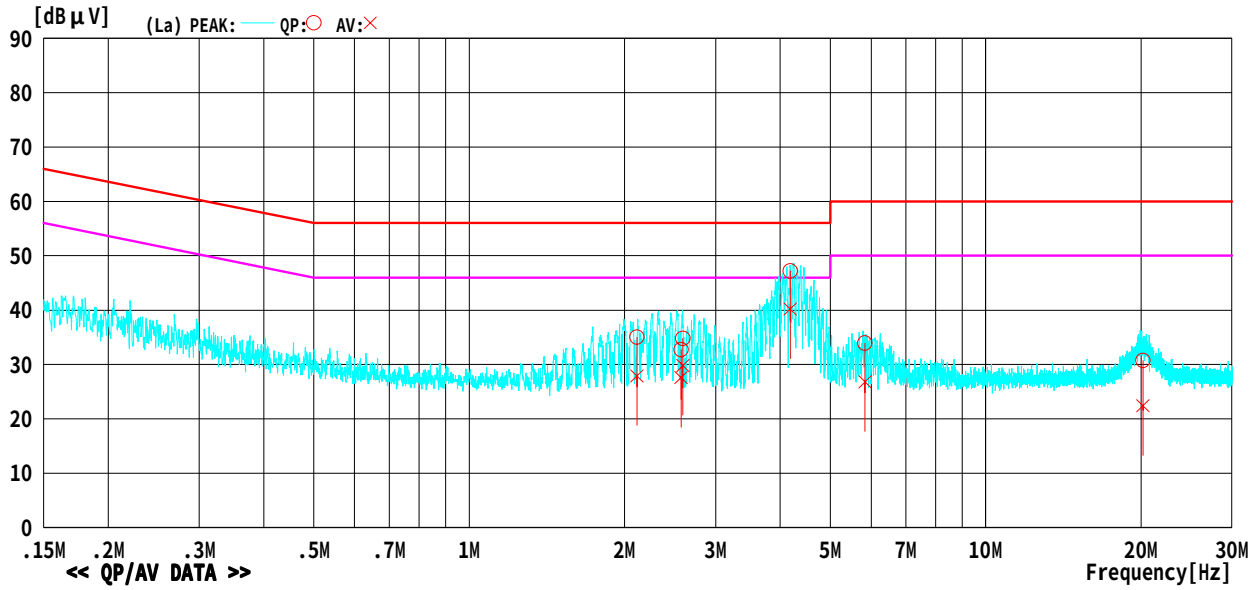
Peak Hold Wave Form

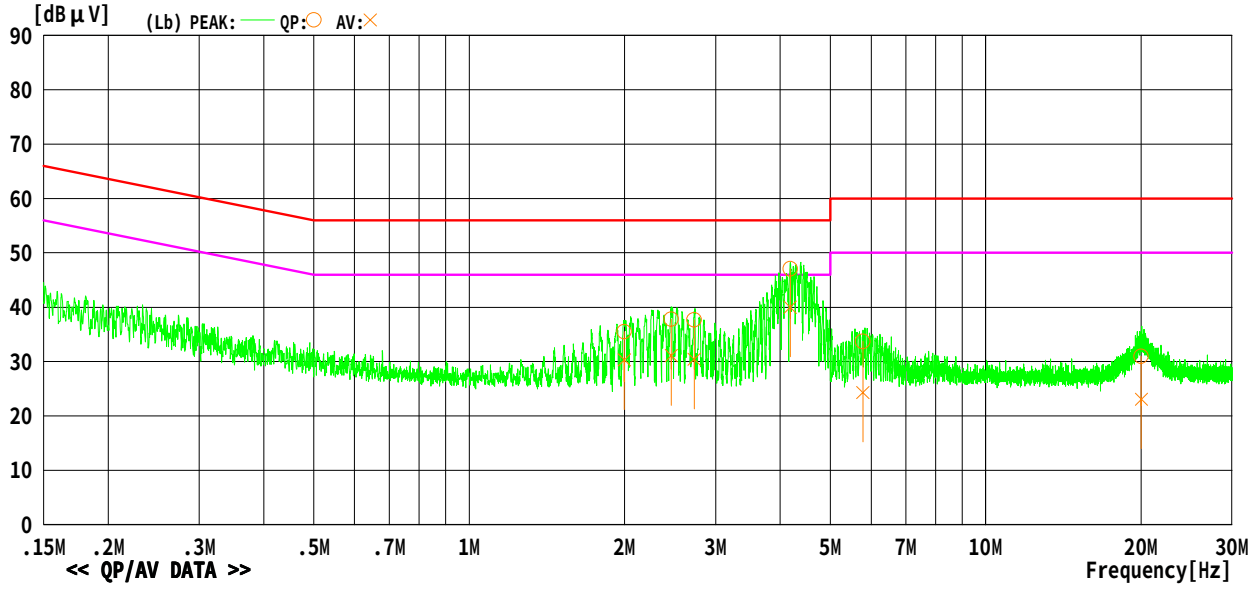
Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V,60Hz

Job No : CJ07-064224E
Temp/Humi : 23°C/45%
Condition : Operated CH:39 (2441MHz)
Remark :

Memo : RBW:9kHz(150k-30MHz)

LIMIT : FCC 15.207(QP)
FCC 15.207(AV)





5.2 15. 247(a)(1) Spectrum Bandwidth and Channel Separation of Frequency Hopping Spread Spectrum System

5.2.1 Setting Remarks

- The both side of 20dB down value from peak power are measured by using delta-maker function of the spectrum analyzer.
- The spectrum analyzer is set-up as following;

✓	Frequency Span	: 10 MHz
✓	Resolution bandwidth	: 300 kHz
✓	Video bandwidth	: 300 kHz
✓	Sweep	: Auto
✓	Detector function	: Peak
✓	Trace Mode	: Max Hold

- See test configuration figure 4.2.

5.2.2 Minimum Standard

The maximum permissible 20dB bandwidth is 1MHz, unless more than 15 non-overlapping channels are employed.

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

5.2.3 Result

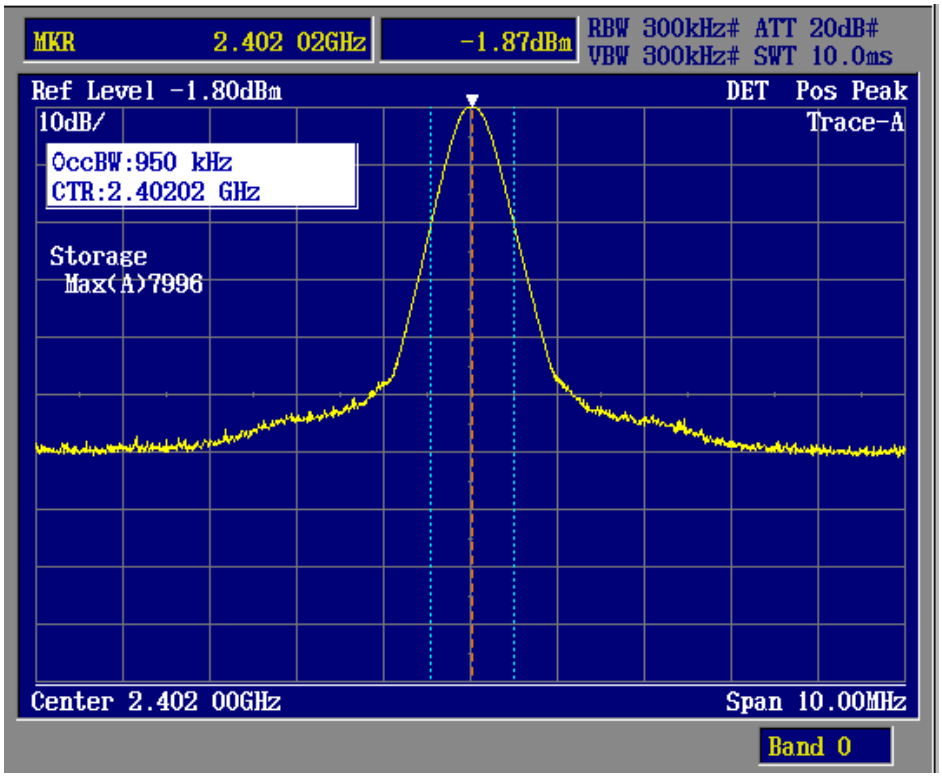
EUT complies with the requirement.

Uncertainty of measurement	: ± 1.2 dB
Temperature, Humidity	: 23˚C, 45%

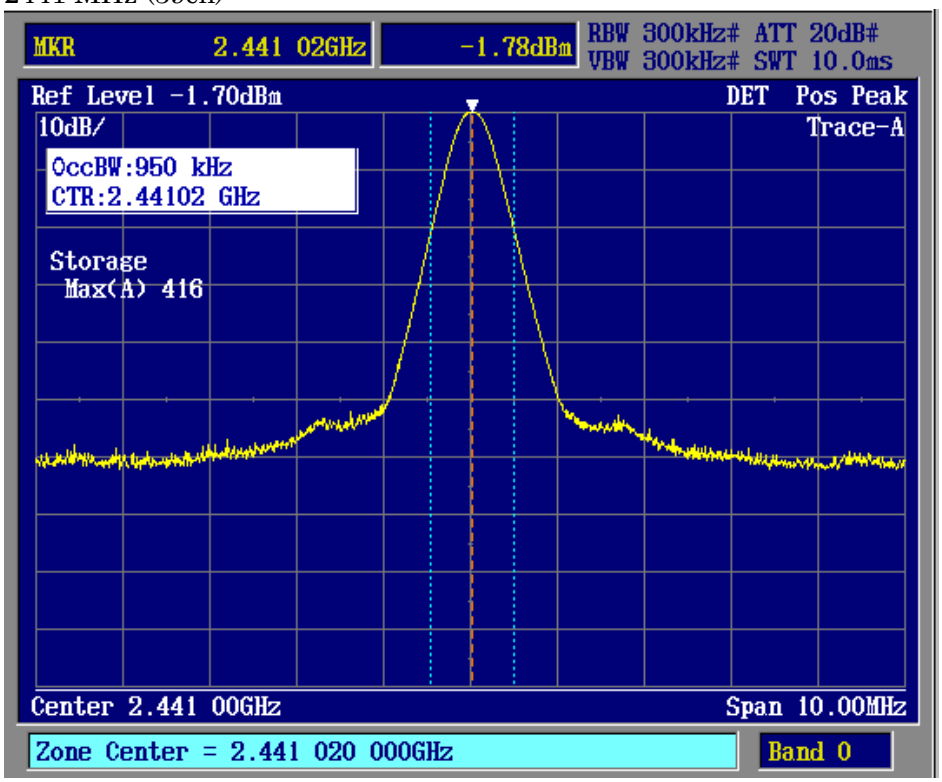
5.2.4 Measured Data

Frequency (MHz)	Measured Bandwidth (kHz)	Limit (MHz)
20 dB band width		
2402 (1ch)	950	< 1
2441 (39ch)	950	< 1
2480 (78ch)	940	< 1
Channel separation		
Hopping channel	1,250	

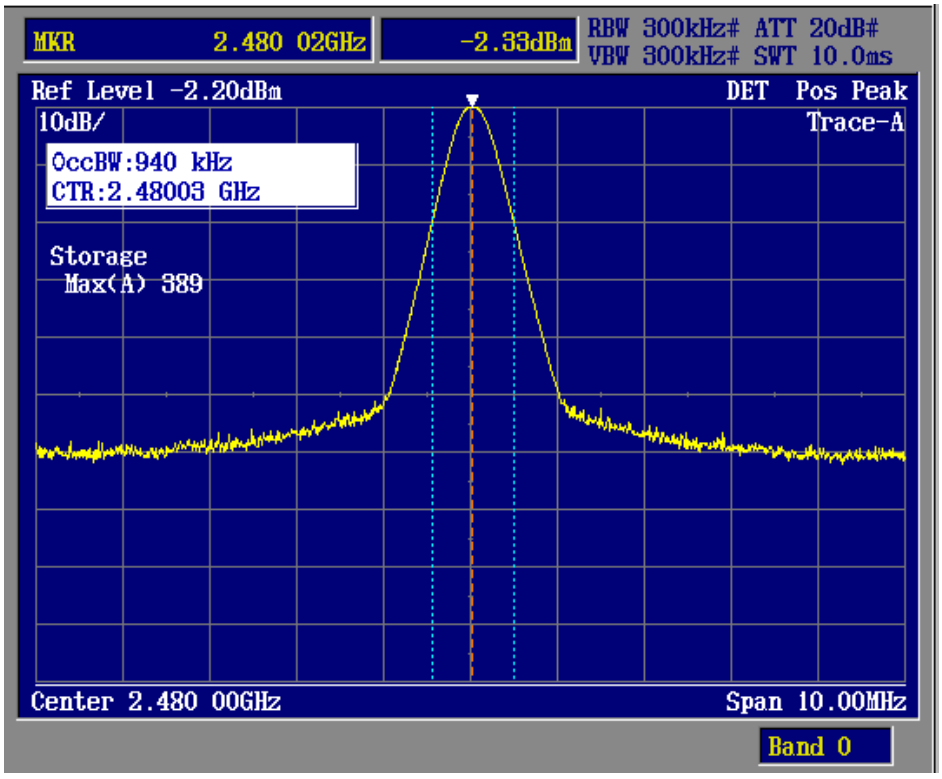
2402 MHz (1ch)



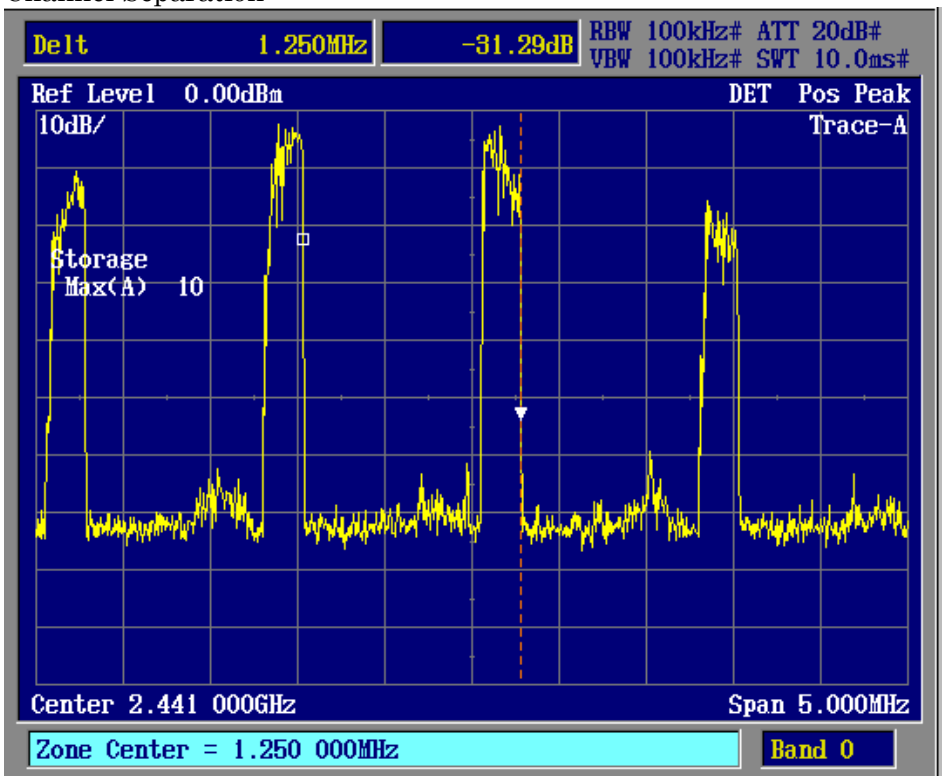
2441 MHz (39ch)



2480 MHz (78ch)



Channel Separation



5.3 15. 247(b) Maximum Peak Output Power

5.3.1 Setting Remarks

- See test configuration figure 4.3.
- The maximum peak output power is measured as following;

1. The diode detector is inserted between EUT and the oscilloscope.
2. The oscilloscope is used to read the peak response of the detector.
3. Replaced EUT by the signal generator (SG).
4. Adjusted the frequency of SG to the fundamental frequency.
5. Adjusted the amplitude of SG to be the same peak recorded in 2.

- The oscilloscope is set-up as following;

✓	Voltage level range	: 10 mV / Div
✓	Sampling time	: 1.00GS / s
✓	Function	: Peak search

5.3.2 Minimum Standard

The maximum peak output power shall not exceed 1 watt. If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.3.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 0.5 dB
Temperature, Humidity : 23˚C, 45%

5.3.4 Measured Data

(Normal Rated Voltage, 5.0 VDC)

Frequency (MHz)	Peak Power (dBm)	Limit (dB)	Margin (dB)
2402 (1ch)	-1.2	30	31.2
2441 (39ch)	-1.0	30	31
2480 (78ch)	-1.5	30	31.5

(High-varied voltage, 5.75 VDC)

Frequency (MHz)	Peak Power (dBm)	Limit (dB)	Margin (dB)
2402 (1ch)	-1.3	30	31.3
2441 (39ch)	-1.0	30	31
2480 (78ch)	-1.5	30	31.5

(Low-varied voltage, 4.25 VDC)

Frequency (MHz)	Peak Power (dBm)	Limit (dB)	Margin (dB)
2402 (1ch)	-1.1	30	31.1
2441 (39ch)	-1.1	30	31.1
2480 (78ch)	-1.5	30	31.5

5.4 15. 247(d) Transmitter Spurious Emissions (Conducted)

5.4.1 Setting Remarks

- EUT directly connects to the spectrum analyzer via calibrated coaxial cable and a suitable attenuator.
- The Spectrums are scanned from the lowest generated frequency of EUT up to the 10th harmonics by using the spectrum analyzer.
- The spectrum analyzer is set-up as following;

✓	Resolution bandwidth	: 100 kHz
✓	Video bandwidth	: 1 MHz
✓	Sweep	: Auto
✓	Detector function	: Peak
✓	Trace Mode	: Max Hold

- See test configuration figure 4.2.

5.4.2 Minimum Standard

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

5.4.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 0.8 dB
Temperature, Humidity : 23˚C, 45%

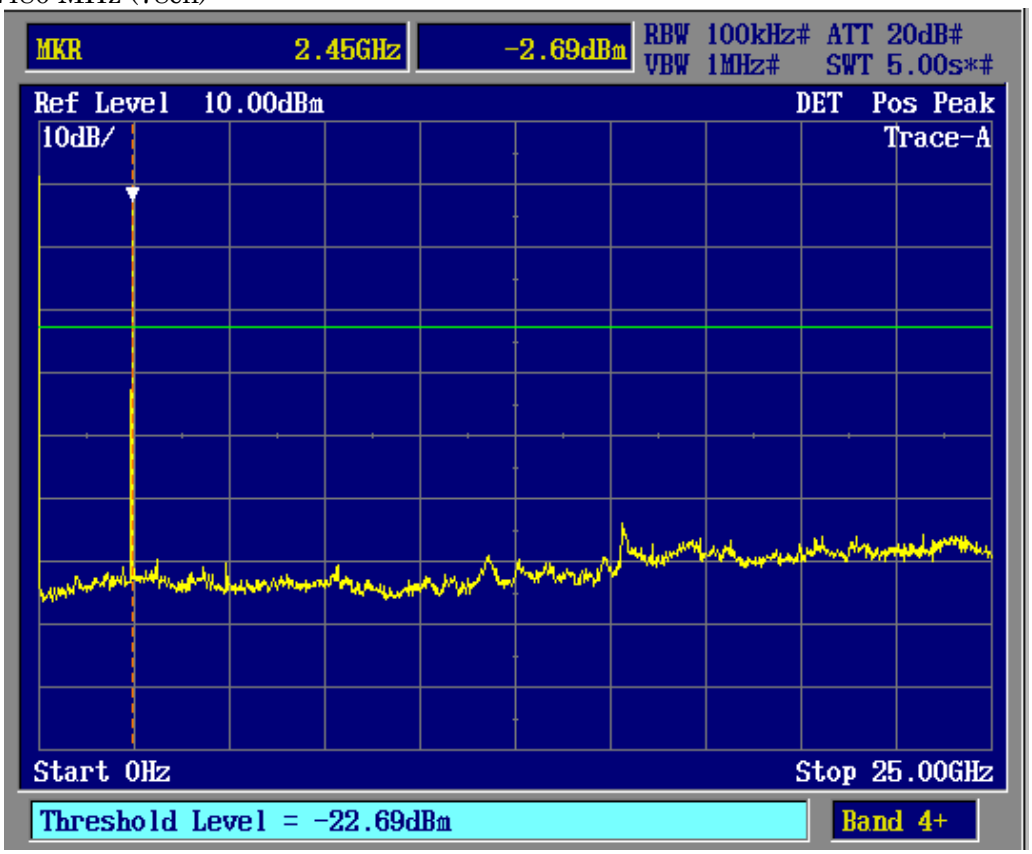
5.4.4 Measured Data (No emission exceeding the 20dB limit was found)

2402 MHz (1ch)

2441 MHz (39ch)

MKR 2.43GHz
-1.85dBm
RBW 100kHz#
VBW 1MHz#
ATT 20dB#
SWT 5.00s*#
Ref Level 10.00dBm
DET Pos Peak
10dB/
Trace-A
Start 0Hz
Stop 25.00GHz
Threshold Level = -21.85dBm
Band 4+

2480 MHz (78ch)



5.5 15.209 / 15. 247(d) Transmitter Radiated Emissions (Radiated)

5.5.1 Setting Remarks

- The data lists in "5.5.4 Measured Data " list the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, plus the limit.
- In the frequency range between 30MHz to 25 GHz (as 10th harmonics), the Electric Field Strength is measured in accordance with ANSI C63.4: 2003 and CISPR22: 1997.
- The test setup is made in accordance with ANSI C63.4: 2003.
- The antenna is measured at 1-4m height.
- The EUT is placed on the non-conductive table in the center of turntable. The height of this table is 0.8m.
- The measurement is carried out with both horizontal and vertical antenna polarization.
- The highest radiation from the equipment is recorded.
- By varying the configuration of the test sample and the cable routing, it is attempted to maximize the emission.
- The test receiver with Quasi Peak and Average detector is in compliance with CISPR 16-1:1993.
- The spectrum analyzer is set-up as following;

Note: Angle 1~3 : Refer to page 51 and 52, Appendix A

(Frequency range : 30 - 1000 MHz)

- ✓ Resolution bandwidth : 100 kHz
- ✓ Video bandwidth : 300 kHz
- ✓ Detector function : Peak
- ✓ Trace Mode : Max Hold

(Frequency range : Above 1000 MHz)

- ✓ Resolution bandwidth : 1 MHz
- ✓ Video bandwidth : 1 MHz
- ✓ Detector function : Peak
- ✓ Trace Mode : Max Hold

- EMI Test Receiver analyzer is set-up as following;

- ✓ IF bandwidth : 120 kHz (Quasi-Peak Detector)
- ✓ IF bandwidth : 1 MHz (Average Detector)

- See test configuration figure 4.4.
- Measurement distance : 3m

Note: The worst data is attached (Page 22 to 36).

5.5.2 Minimum Standard

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.5.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 3.28 dB
Temperature, Humidity : See each data table

5.5.4 Measured Data

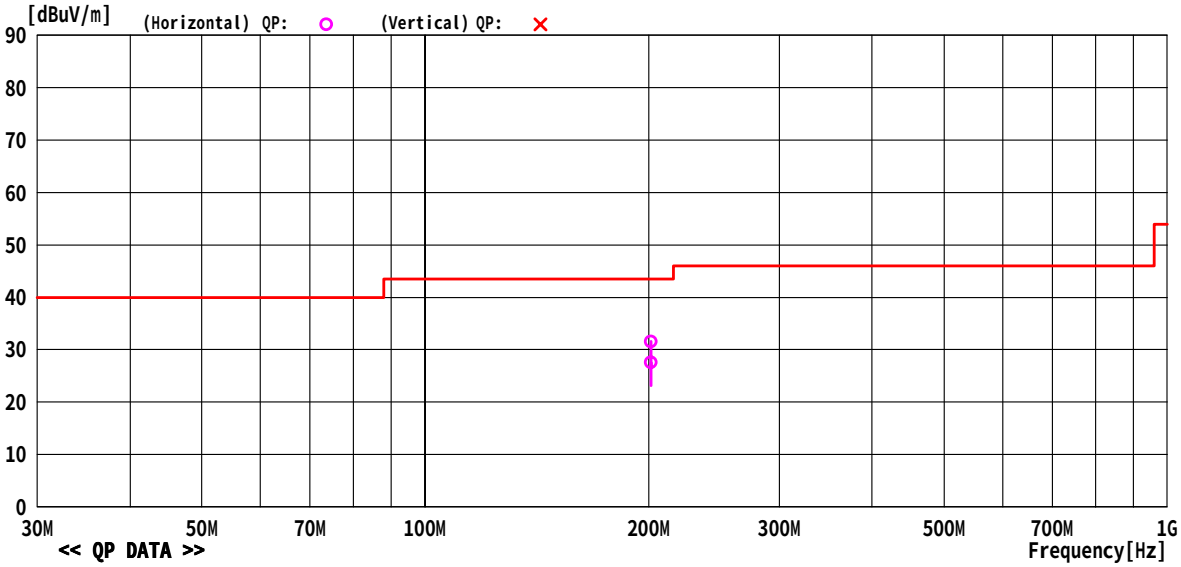
30MHz to 1GHz, Channel 1(Angle1)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No : CJ07-064224E
Temp./Humi. : 21°C/42%
Condition : Operated CH:01(2402MHz)
Remark : Angle1

Memo : RBW:30M～1GHz(120kHz)

LIMIT : FCC 15.209 3m



<< QP DATA >>

No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	201.617	34.4	-6.8	27.6	43.5	15.9	Hori.	100	180	BC	QP
2	201.617	38.3	-6.8	31.5	43.5	12.0	Hori.	100	180	BC	PK

-TEPTO-DV/RE Ver 1.80.0020

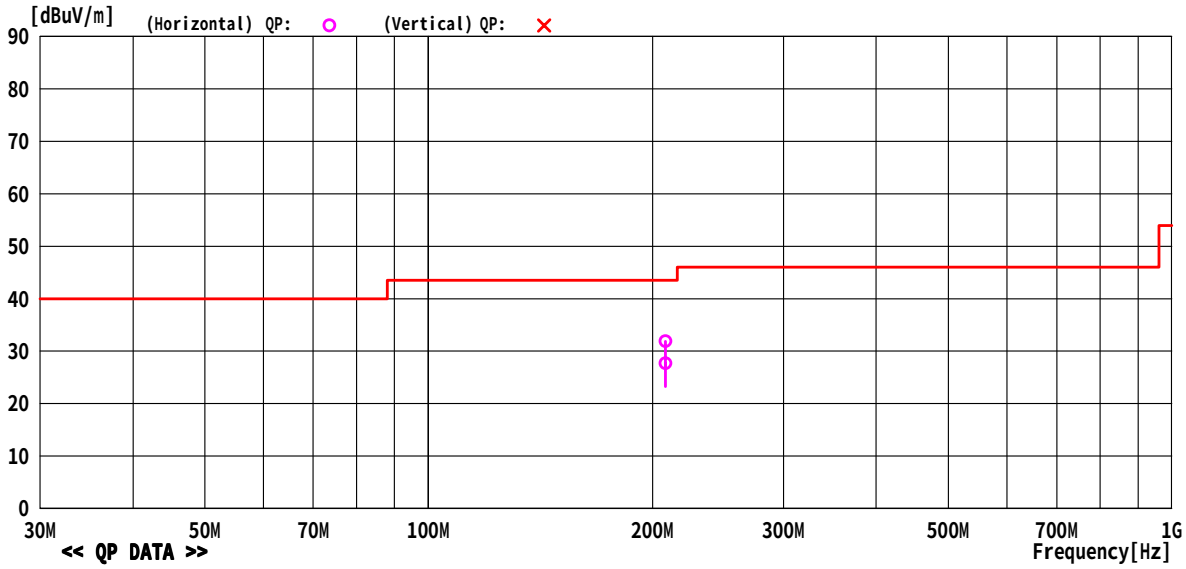
30MHz to 1GHz, Channel 39 (Angle1)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No : CJ07-064224E
Temp./Humi. : 21°C/42%
Condition : Operated CH:39(2441MHz)
Remark : Angle1

Memo : RBW:30M～1GHz(120kHz)

LIMIT : FCC 15.209 3m



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	208.271	34.2	-6.5	27.7	43.5	15.8	Hori.	100	166	BC	QP
2	208.271	38.3	-6.5	31.8	43.5	11.7	Hori.	100	166	BC	PK

-TEPTO-DV/RE Ver 1.80.0020

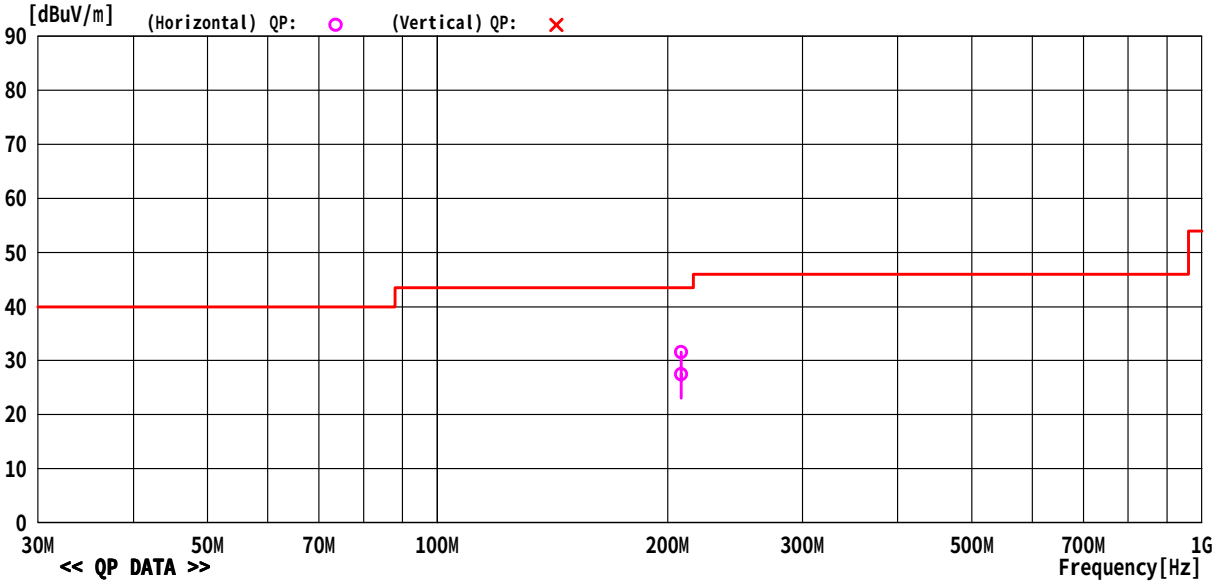
30MHz to 1GHz, Channel 79 (Angle1)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No : CJ07-064224E
Temp./Humi. : 21℃/42%
Condition : Operated CH:79(2480MHz)
Remark : Angle1

Memo : RBW:30M～1GHz(120kHz)

LIMIT : FCC 15.209 3m



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	208.131	34.0	-6.5	27.5	43.5	16.0	Hori.	100	166	BC	QP
2	208.131	38.0	-6.5	31.5	43.5	12.0	Hori.	100	166	BC	PK

-TEPTO-DV/RE Ver 1.80.0020

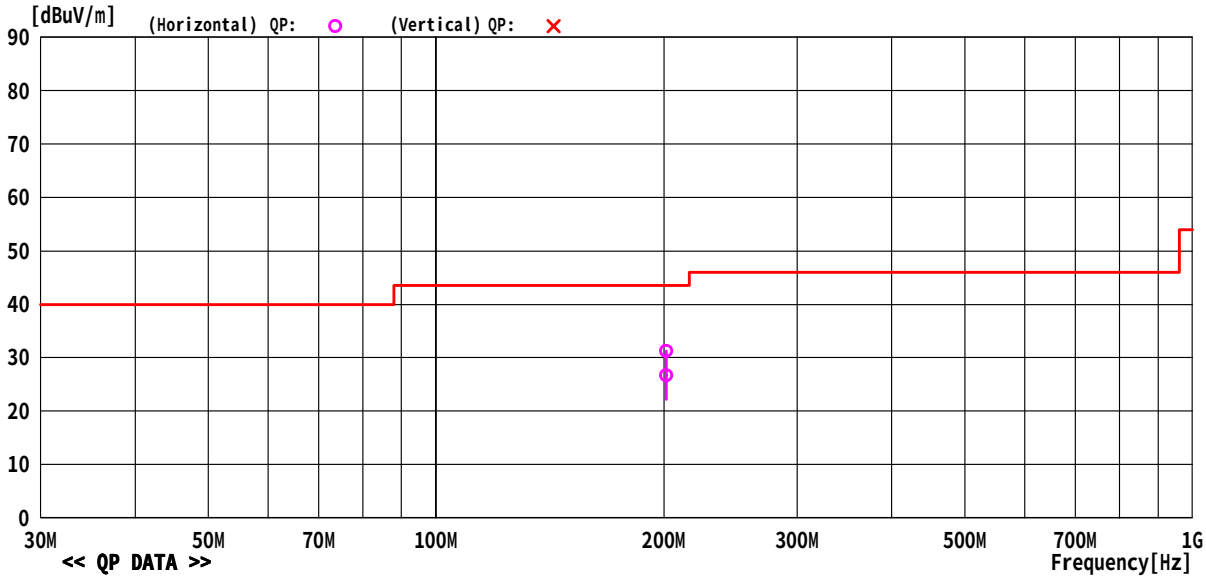
30MHz to 1GHz, Channel 1(Angle2)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No : CJ07-064224E
Temp./Humi. : 21°C/42%
Condition : Operated CH:01(2402MHz)
Remark : Angle2

Memo : RBW:30M～1GHz(120kHz)

LIMIT : FCC 15.209 3m



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	201.518	33.5	-6.8	26.7	43.5	16.8	Hori.	100	176	BC	QP
2	201.518	38.0	-6.8	31.2	43.5	12.3	Hori.	100	176	BC	PK

-TEPTO-DV/RE Ver 1.80.0020

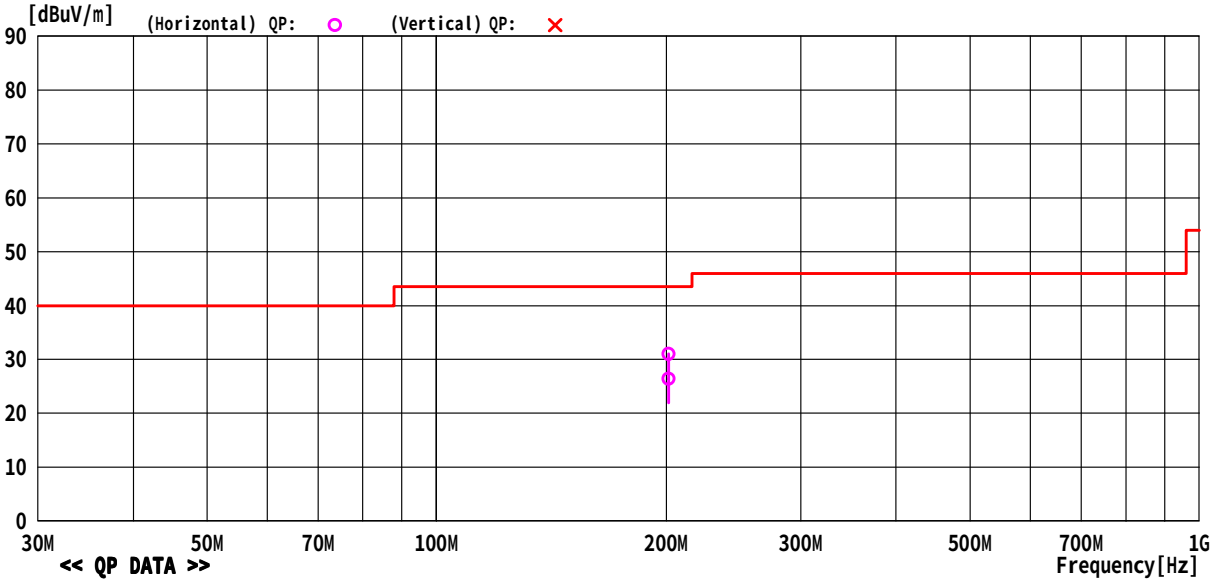
30MHz to 1GHz, Channel 1 (Angle3)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No : CJ07-064224E
Temp./Humi. : 21℃/42%
Condition : Operated CH:01(2402MHz)
Remark : Angle3

Memo : RBW:30M～1GHz(120kHz)

LIMIT : FCC 15.209 3m



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	201.402	33.2	-6.8	26.4	43.5	17.1	Hori.	100	158	BC	QP
2	201.402	37.8	-6.8	31.0	43.5	12.5	Hori.	100	158	BC	PK

-TEPTO-DV/RE Ver 1.80.0020

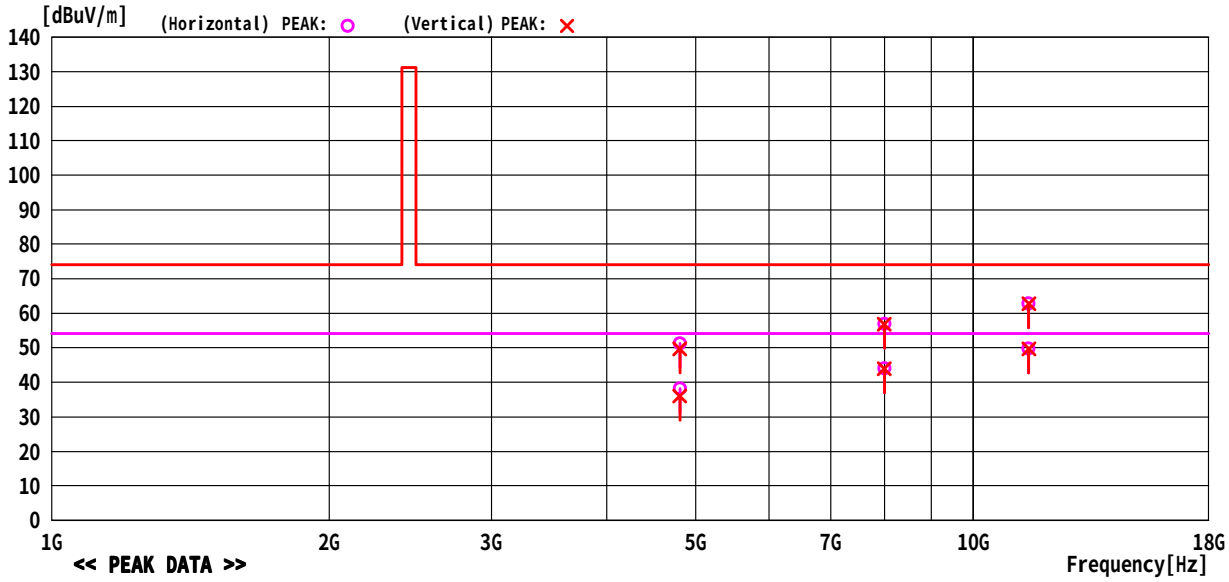
1GHz to 18GHz, Channel 1 (Angle1)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ07-064224E
Temp/Humi : 20°C/43%
Condition : Operated CH:01 (2402MHz)
Remark : Angle1

Memo : RBW:1GHz～(1MHz)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	4803.951	46.5	4.8	51.3	74.0	22.7	Hori.	100	204	HRN	PK
2	4803.951	33.3	4.8	38.1	74.0	35.9	Hori.	100	204	HRN	AV
3	8002.000	44.5	12.4	56.9	74.0	17.1	Hori.	100	1	HRN	PK
4	8002.000	31.6	12.4	44.0	74.0	30.1	Hori.	100	1	HRN	AV
5	1483.450	44.4	18.4	62.8	74.0	11.2	Hori.	100	358	HRN	PK Freq:11483.450MHz
6	1483.450	31.3	18.4	49.7	74.0	24.3	Hori.	100	358	HRN	AV Freq:11483.450MHz
7	4803.791	44.9	4.8	49.7	74.0	24.3	Vert.	100	147	HRN	PK
8	4803.791	31.2	4.8	36.0	74.0	38.0	Vert.	100	147	HRN	AV
9	8002.000	44.5	12.4	56.9	74.0	17.1	Vert.	100	358	HRN	PK
10	8002.000	31.6	12.4	44.0	74.0	30.0	Vert.	100	358	HRN	AV
11	1483.450	44.4	18.4	62.8	74.0	11.2	Vert.	100	171	HRN	PK Freq:11483.450MHz
12	1483.450	31.3	18.4	49.7	74.0	24.3	Vert.	100	171	HRN	AV Freq:11483.450MHz

-TEPTO-DV/RE Ver1.80.0020

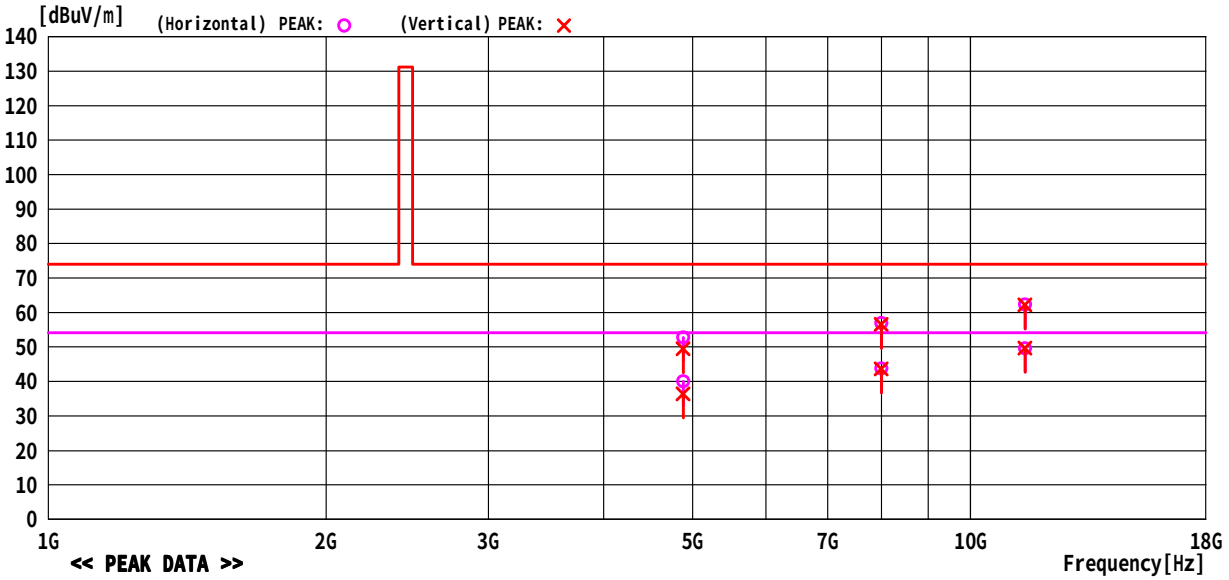
1GHz to 18GHz, Channel 39 (Angle1)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ07-064224E
Temp/Humi : 20°C/43%
Condition : Operated CH:39 (2441MHz)
Remark : Angle1

Memo : RBW:1GHz～(1MHz)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)



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No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	4881.916	47.5	5.3	52.8	74.0	21.2	Hori.	100	206	HRN	PK
2	4881.916	34.7	5.3	40.0	74.0	34.0	Hori.	100	206	HRN	AV
3	8002.000	44.5	12.4	56.9	74.0	17.1	Hori.	100	358	HRN	PK
4	8002.000	31.2	12.4	43.6	74.0	30.4	Hori.	100	358	HRN	AV
5	1459.410	31.3	18.3	49.6	74.0	24.4	Hori.	100	20	HRN	AV Freq:11459.410MHz
6	1459.410	44.0	18.3	62.3	74.0	11.7	Hori.	100	20	HRN	PK Freq:11459.410MHz
7	4881.992	44.2	5.3	49.5	74.0	24.5	Vert.	100	107	HRN	PK
8	4881.992	31.1	5.3	36.4	74.0	37.6	Vert.	100	107	HRN	AV
9	8002.000	31.2	12.4	43.6	74.0	30.4	Vert.	100	1	HRN	AV
10	8002.000	44.1	12.4	56.5	74.0	17.5	Vert.	100	1	HRN	PK
11	1459.410	31.3	18.3	49.6	74.0	24.4	Vert.	100	3	HRN	AV Freq:11459.410MHz
12	1459.410	44.0	18.3	62.3	74.0	11.7	Vert.	100	3	HRN	PK Freq:11459.410MHz

-TEPTO-DV/RE Ver1.80.0020

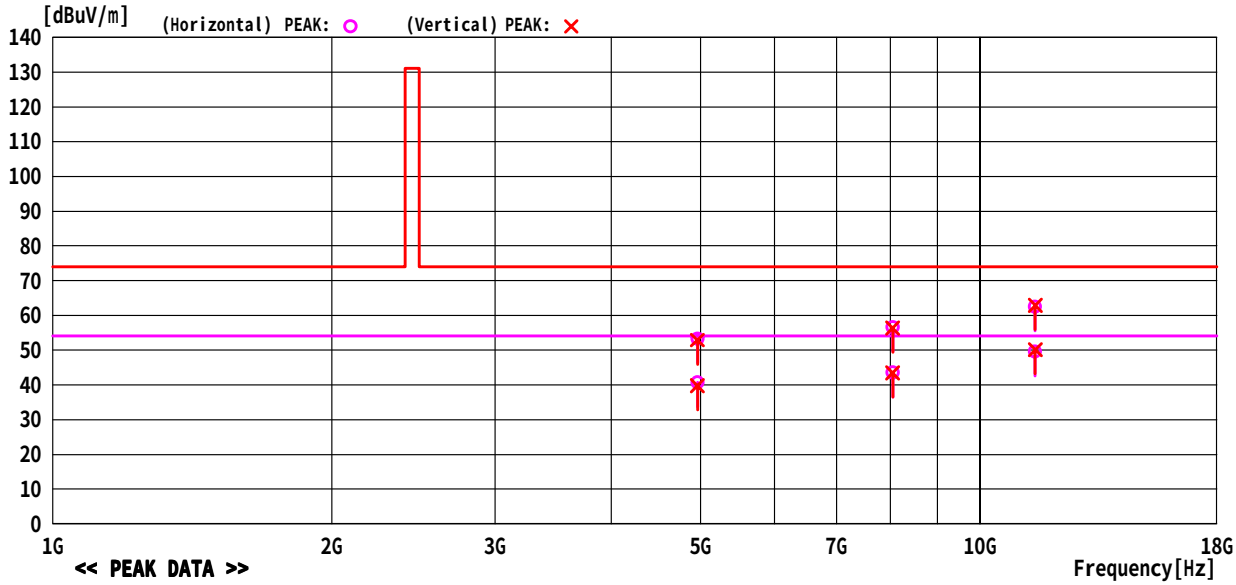
1GHz to 18GHz, Channel 79 (Angle1)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ07-064224E
Temp/Humi : 20°C/43%
Condition : Operated CH:79 (2480MHz)
Remark : Angle1

Memo : RBW:1GHz～(1MHz)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)



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No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	4959.932	47.5	5.8	53.3	74.0	20.7	Hori.	100	210	HRN	PK
2	4959.932	34.8	5.8	40.6	74.0	33.4	Hori.	100	210	HRN	AV
3	8052.100	44.1	12.4	56.5	74.0	17.5	Hori.	100	1	HRN	PK
4	8052.100	31.1	12.4	43.5	74.0	30.5	Hori.	100	1	HRN	AV
5	1465.420	44.2	18.3	62.5	74.0	11.5	Hori.	100	135	HRN	PK Freq:11465.420MHz
6	1465.420	31.3	18.3	49.6	74.0	24.4	Hori.	100	135	HRN	AV Freq:11465.420MHz
7	4959.952	47.1	5.8	52.9	74.0	21.1	Vert.	100	139	HRN	PK
8	4959.952	34.0	5.8	39.8	74.0	34.2	Vert.	100	139	HRN	AV
9	8052.100	44.0	12.4	56.4	74.0	17.6	Vert.	100	358	HRN	PK
10	8052.100	31.1	12.4	43.5	74.0	30.5	Vert.	100	358	HRN	AV
11	1465.420	44.7	18.3	63.0	74.0	11.1	Vert.	100	137	HRN	PK Freq:11465.420MHz
12	1465.420	31.8	18.3	50.1	74.0	23.9	Vert.	100	137	HRN	AV Freq:11465.420MHz

-TEPTO-DV/RE Ver1.80.0020

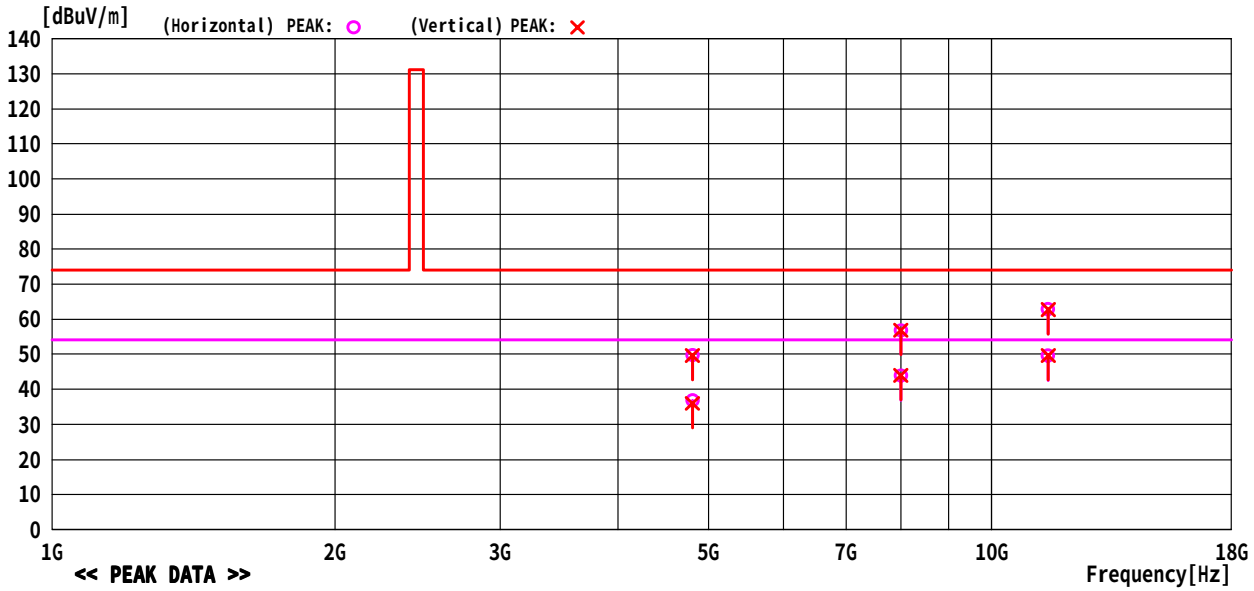
1GHz to 18GHz, Channel 1 (Angle2)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ07-064224E
Temp/Humi : 20°C/43%
Condition : Operated CH:01 (2402MHz)
Remark : Angle2

Memo : RBW:1GHz～(1MHz)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	4804.002	45.0	4.8	49.8	74.0	24.2	Hori.	100	208	HRN	PK
2	4804.002	32.1	4.8	36.9	74.0	37.1	Hori.	100	208	HRN	AV
3	8002.980	31.5	12.4	43.9	74.0	30.1	Hori.	100	0	HRN	AV
4	8002.980	44.4	12.4	56.8	74.0	17.2	Hori.	100	0	HRN	PK
5	1484.240	31.2	18.4	49.6	74.0	24.4	Hori.	100	0	HRN	AV Freq:11484.240MHz
6	1484.240	44.4	18.4	62.8	74.0	11.2	Hori.	100	0	HRN	PK Freq:11484.240MHz
7	4803.778	44.9	4.8	49.7	74.0	24.3	Vert.	100	165	HRN	PK
8	4803.778	31.2	4.8	36.0	74.0	38.0	Vert.	100	165	HRN	AV
9	8002.980	44.5	12.4	56.9	74.0	17.1	Vert.	100	355	HRN	PK
10	8002.980	31.6	12.4	44.0	74.0	30.0	Vert.	100	355	HRN	AV
11	1484.240	44.4	18.4	62.8	74.0	11.2	Vert.	100	193	HRN	PK Freq:11484.240MHz
12	1484.240	31.3	18.4	49.7	74.0	24.3	Vert.	100	193	HRN	AV Freq:11484.240MHz

-TEPTO-DV/RE Ver1.80.0020

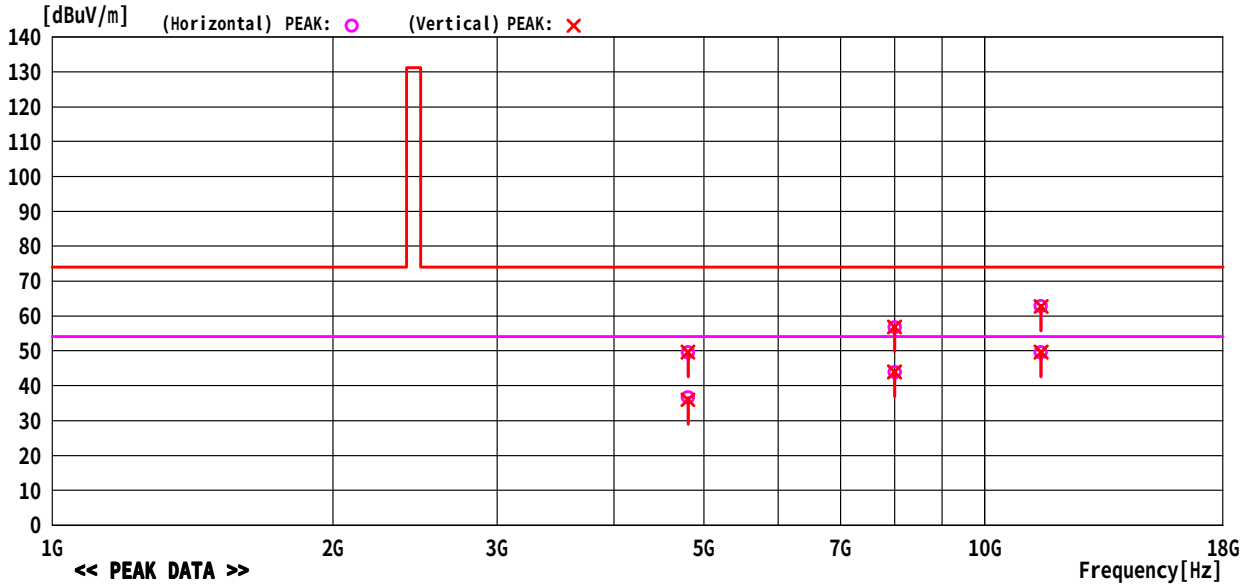
1GHz to 18GHz, Channel 1 (Angle3)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V, 60Hz

Job No. : CJ07-064224E
Temp/Humi : 20°C/43%
Condition : Operated CH:01 (2402MHz)
Remark : Angle3

Memo : RBW:1GHz～(1MHz)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)



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No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	4804.125	31.8	4.8	36.6	74.0	37.4	Hori.	100	197	HRN	AV
2	4804.125	44.8	4.8	49.6	74.0	24.4	Hori.	100	197	HRN	PK
3	8003.230	44.4	12.4	56.8	74.0	17.2	Hori.	100	5	HRN	PK
4	8003.230	31.5	12.4	43.9	74.0	30.1	Hori.	100	5	HRN	AV
5	1486.220	44.4	18.4	62.8	74.0	11.2	Hori.	100	0	HRN	PK Freq:11486.220MHz
6	1486.220	31.2	18.4	49.6	74.0	24.4	Hori.	100	0	HRN	AV Freq:11486.220MHz
7	4804.231	31.2	4.8	36.0	74.0	38.0	Vert.	100	163	HRN	AV
8	4804.231	44.9	4.8	49.7	74.0	24.3	Vert.	100	163	HRN	PK
9	8003.230	31.6	12.4	44.0	74.0	30.0	Vert.	100	0	HRN	AV
10	8003.230	44.5	12.4	56.9	74.0	17.1	Vert.	100	0	HRN	PK
11	1486.220	31.3	18.4	49.7	74.0	24.3	Vert.	100	180	HRN	AV Freq:11486.220MHz
12	1486.220	44.4	18.4	62.8	74.0	11.2	Vert.	100	180	HRN	PK Freq:11486.220MHz

-TEPTO-DV/RE Ver1.80.0020

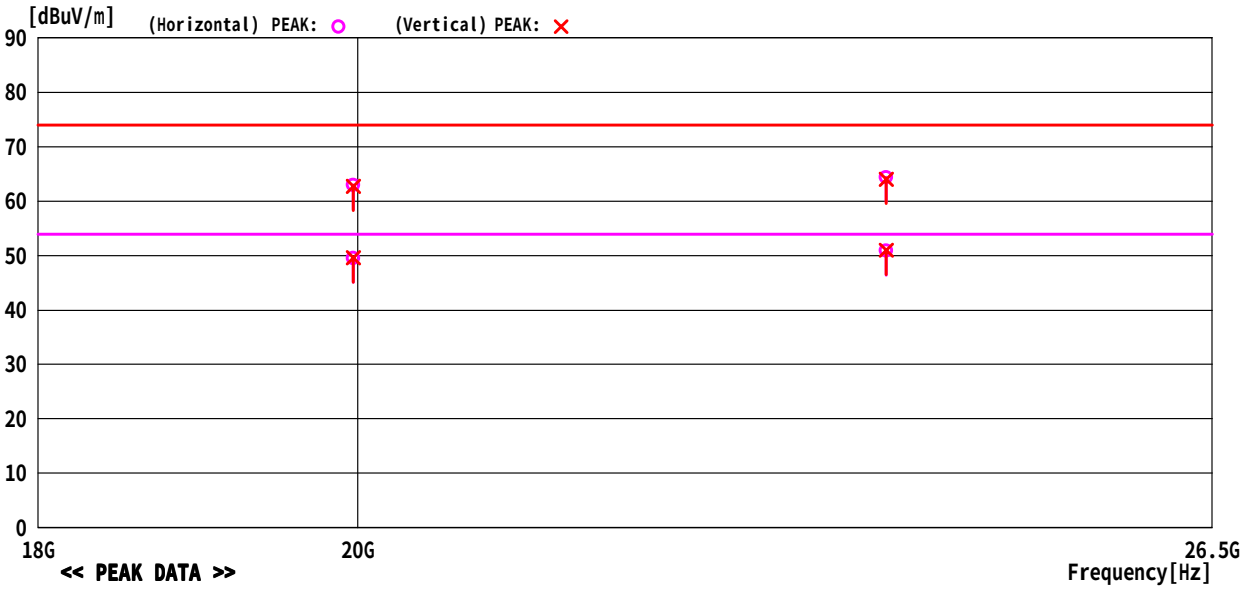
18GHz to 26.5GHz, Channel 1 (Angle1)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz

Job No : CJ07-064224E
Temp/Humi : 20°C,32%
Condition : Operated CH:01(2402MHz)
Remark : Angle1

Memo : RBW:1MHz(1G～)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	9968.910	42.6	20.3	62.9	74.0	11.1	Hori.	100	167	HRN	PK Freq:19968.910MHz
2	9968.910	29.3	20.3	49.6	74.0	24.4	Hori.	100	167	HRN	AV Freq:19968.910MHz
3	3800.490	43.6	20.8	64.4	74.0	9.6	Hori.	100	359	HRN	PK Freq:23800.490MHz
4	3800.490	30.1	20.8	50.9	74.0	23.1	Hori.	100	359	HRN	AV Freq:23800.490MHz
5	9968.910	42.4	20.3	62.7	74.0	11.3	Vert.	100	328	HRN	PK Freq:19968.910MHz
6	9968.910	29.3	20.3	49.6	74.0	24.4	Vert.	100	328	HRN	AV Freq:19968.910MHz
7	3800.490	43.2	20.8	64.0	74.0	10.0	Vert.	100	359	HRN	PK Freq:23800.490MHz
8	3800.490	30.2	20.8	51.0	74.0	23.0	Vert.	100	359	HRN	AV Freq:23800.490MHz

-TEPTO-DV/Ver 1.80.0020

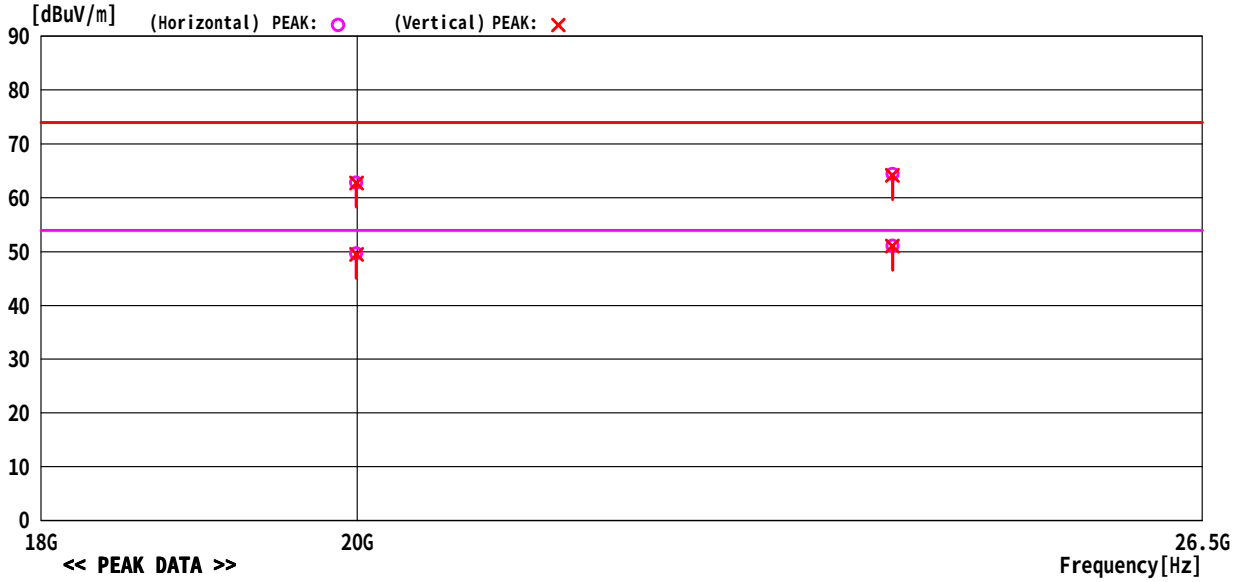
18GHz to 26.5GHz, Channel 39 (Angle1)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz

Job No : CJ07-064224E
Temp/Humi : 20°C,32%
Condition : Operated CH:39(2441MHz)
Remark : Angle1

Memo : RBW:1MHz(1G～)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	9992.970	42.5	20.3	62.8	74.0	11.2	Hori.	100	359	HRN	PK Freq:19992.970MHz
2	9992.970	29.3	20.3	49.6	74.0	24.4	Hori.	100	359	HRN	AV Freq:19992.970MHz
3	3900.740	43.5	20.8	64.3	74.0	9.7	Hori.	100	156	HRN	PK Freq:23900.740MHz
4	3900.740	30.2	20.8	51.0	74.0	23.0	Hori.	100	156	HRN	AV Freq:23900.740MHz1
5	9992.970	42.4	20.3	62.7	74.0	11.3	Vert.	100	0	HRN	PK Freq:19992.970MHz
6	9992.970	29.2	20.3	49.5	74.0	24.5	Vert.	100	0	HRN	AV Freq:19992.970MHz
7	3900.740	43.3	20.8	64.1	74.0	9.9	Vert.	100	358	HRN	PK Freq:23900.740MHz
8	3900.740	30.2	20.8	51.0	74.0	23.0	Vert.	100	358	HRN	AV Freq:23900.740MHz1

-TEPTO-DV/Ver 1.80.0020

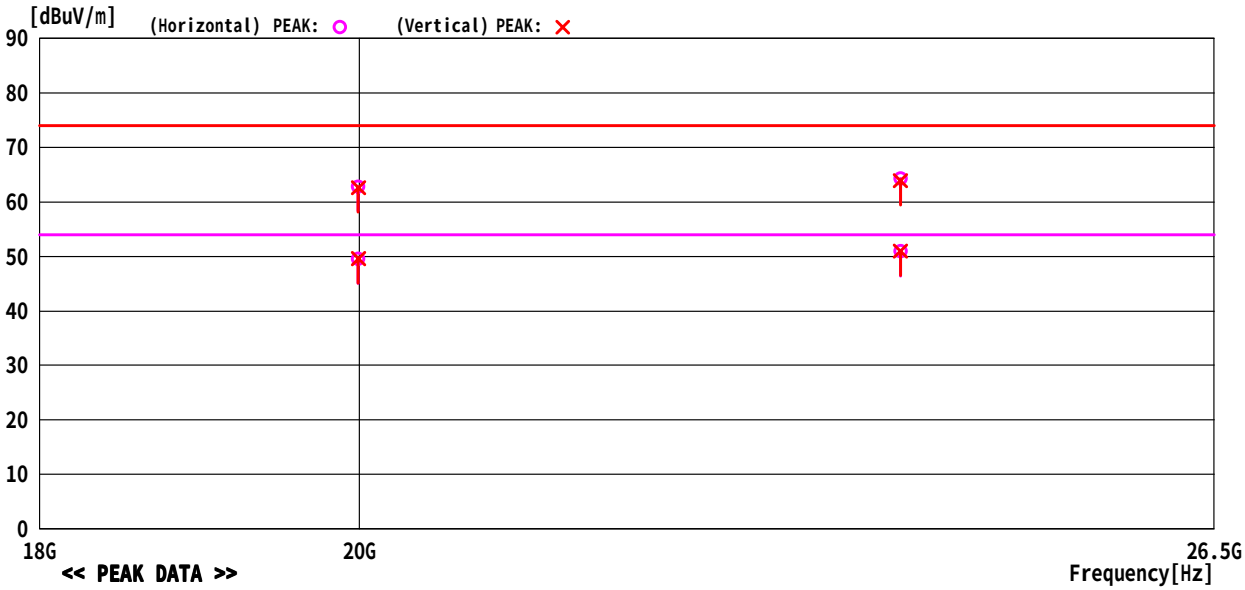
18GHz to 26.5GHz, Channel 79 (Angle1)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz

Job No : CJ07-064224E
Temp/Humi : 20°C,32%
Condition : Operated CH:79(2480MHz)
Remark : Angle1

Memo : RBW:1MHz(1G～)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)



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No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	9992.970	42.5	20.3	62.8	74.0	11.2	Hori.	100	18	HRN	PK Freq:19992.970MHz
2	9992.970	29.2	20.3	49.5	74.0	24.5	Hori.	100	18	HRN	AV Freq:19992.970MHz
3	3900.740	43.5	20.8	64.3	74.0	9.7	Hori.	100	164	HRN	PK Freq:23900.740MHz
4	3900.740	30.1	20.8	50.9	74.0	23.1	Hori.	100	164	HRN	AV Freq:23900.740MHz
5	9992.970	42.3	20.3	62.6	74.0	11.4	Vert.	100	153	HRN	PK Freq:19992.970MHz
6	9992.970	29.3	20.3	49.6	74.0	24.4	Vert.	100	153	HRN	AV Freq:19992.970MHz
7	3900.740	43.1	20.8	63.9	74.0	10.1	Vert.	100	358	HRN	PK Freq:23900.740MHz
8	3900.740	30.2	20.8	51.0	74.0	23.0	Vert.	100	358	HRN	AV Freq:23900.740MHz

-TEPTO-DV/Ver 1.80.0020

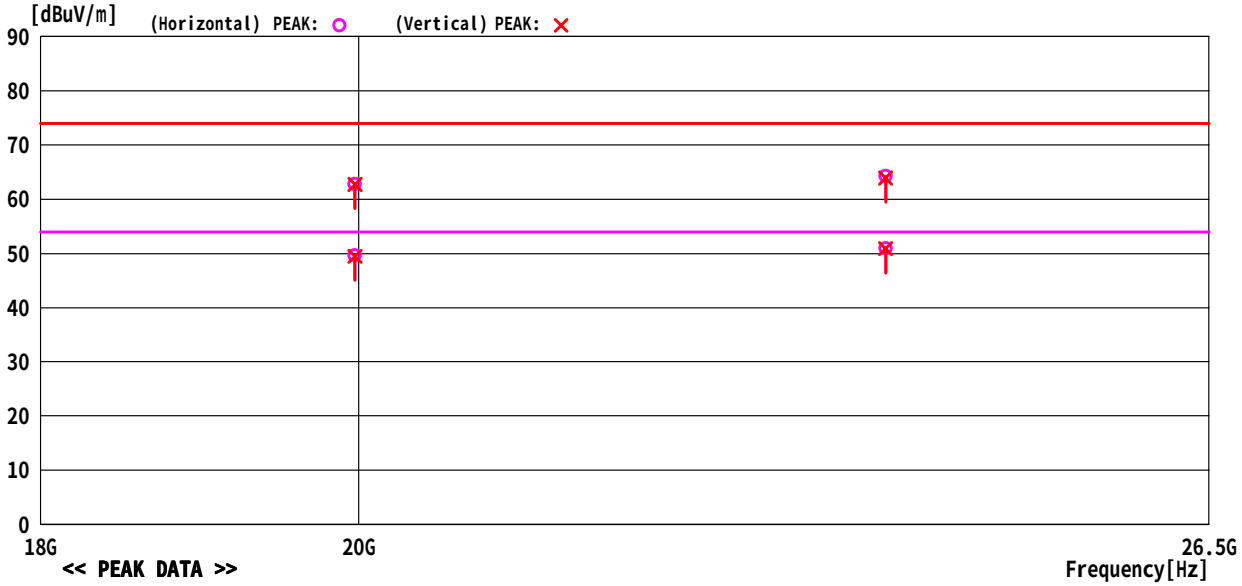
18GHz to 26.5GHz, Channel 1 (Angle2)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz

Job No : CJ07-064224E
Temp/Humi : 20°C,32%
Condition : Operated CH:01(2402MHz)
Remark : Angle2

Memo : RBW:1MHz(1G～)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)



No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	9972.920	42.5	20.3	62.8	74.0	11.2	Hori.	100	358	HRN	PK Freq:19972.920MHz
2	9972.920	29.3	20.3	49.6	74.0	24.4	Hori.	100	358	HRN	AV Freq:19972.920MHz
3	3808.510	43.5	20.8	64.3	74.0	9.7	Hori.	100	73	HRN	PK Freq:23808.510MHz
4	3808.510	30.1	20.8	50.9	74.0	23.1	Hori.	100	73	HRN	AV Freq:23808.510MHz
5	9972.920	42.4	20.3	62.7	74.0	11.3	Vert.	100	359	HRN	PK Freq:19972.920MHz
6	9972.920	29.2	20.3	49.5	74.0	24.5	Vert.	100	359	HRN	AV Freq:19972.920MHz
7	3808.510	43.1	20.8	63.9	74.0	10.1	Vert.	100	359	HRN	PK Freq:23808.510MHz
8	3808.510	30.1	20.8	50.9	74.0	23.1	Vert.	100	359	HRN	AV Freq:23808.510MHz

-TEPTO-DV/Ver 1.80.0020

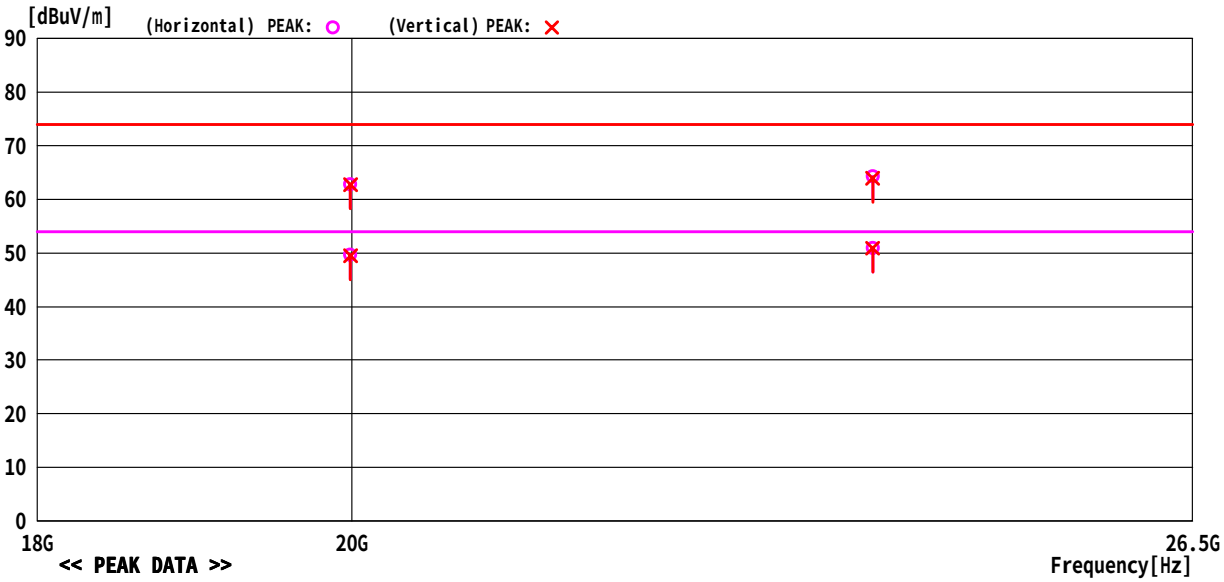
18GHz to 26.5GHz, Channel 1 (Angle3)

Model Name : CT-BT1-REV1.0
Serial No. : CKG40006
Operator : M.Yamanaka
Power Supply : AC 120V , 60Hz

Job No : CJ07-064224E
Temp/Humi : 20°C,32%
Condition : Operated CH:01(2402MHz)
Remark : Angle3

Memo : RBW:1MHz(1G～)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)
FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)



<< PEAK DATA >>

No	Freq. [MHz]	Reading [dBuV]	C.Fac [dB/m]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	9988.960	42.5	20.3	62.8	74.0	11.2	Hori.	100	358	HRN	PK Freq:19988.960MHz
2	9988.960	29.3	20.3	49.6	74.0	24.4	Hori.	100	358	HRN	AV Freq:19988.960MHz
3	3808.510	43.5	20.8	64.3	74.0	9.7	Hori.	100	73	HRN	PK Freq:23808.510MHz
4	3808.510	30.1	20.8	50.9	74.0	23.1	Hori.	100	73	HRN	AV Freq:23808.510MHz
5	9988.960	42.4	20.3	62.7	74.0	11.3	Vert.	100	359	HRN	PK Freq:19988.960MHz
6	9988.960	29.2	20.3	49.5	74.0	24.5	Vert.	100	359	HRN	AV Freq:19988.960MHz
7	3808.510	43.1	20.8	63.9	74.0	10.1	Vert.	100	359	HRN	PK Freq:23808.510MHz
8	3808.510	30.1	20.8	50.9	74.0	23.1	Vert.	100	359	HRN	AV Freq:23808.510MHz

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5.6 15. 247(a)(1) Number of Channels and Time of Occupancy

5.6.1 Setting Remarks

- EUT directly connects to the spectrum analyzer via calibrated coaxial cable and a suitable attenuator.
- The Number of Channels is determined by using Max-hold of the spectrum shape of spectrum analyzer.
- Time of Occupancy is determined by using the marker-data function of spectrum analyzer.
- The spectrum analyzer is set-up as following to measure Number of Channels;

  - ✓ Frequency Span : 79 MHz
  - ✓ Resolution bandwidth : 1 MHz
  - ✓ Video bandwidth : 3 MHz
  - ✓ Sweep Time : Auto
  - ✓ Detector function : Peak
  - ✓ Trace Mode : Max Hold

- The spectrum analyzer is set-up as following to measure Time of Occupancy;

  - ✓ Frequency Span : 0 Hz
  - ✓ Resolution bandwidth : 1 MHz
  - ✓ Video bandwidth : 1 MHz
  - ✓ Detector function : Peak
  - ✓ Trace Mode : Max Hold

- See test configuration figure 4.2.

5.6.2 Minimum Standard

This frequency hopping system must employ minimum of 15 hopping channels.

The maximum permissible time of occupancy is 400 ms within the minimum time period required to hop through all channels.

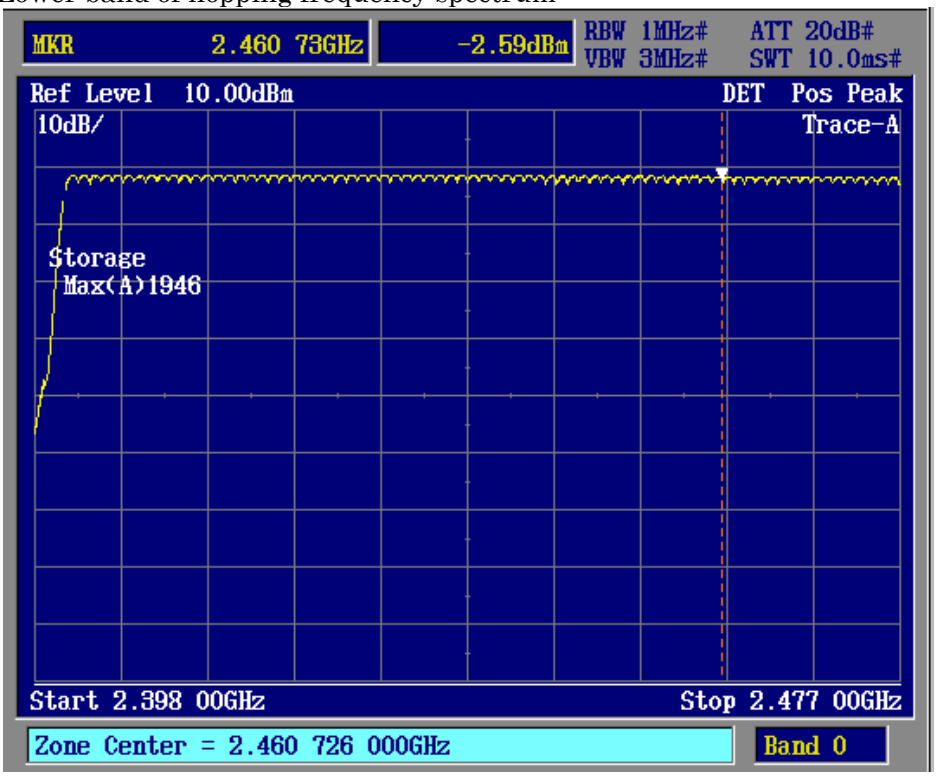
5.6.3 Result

EUT complies with the requirement.

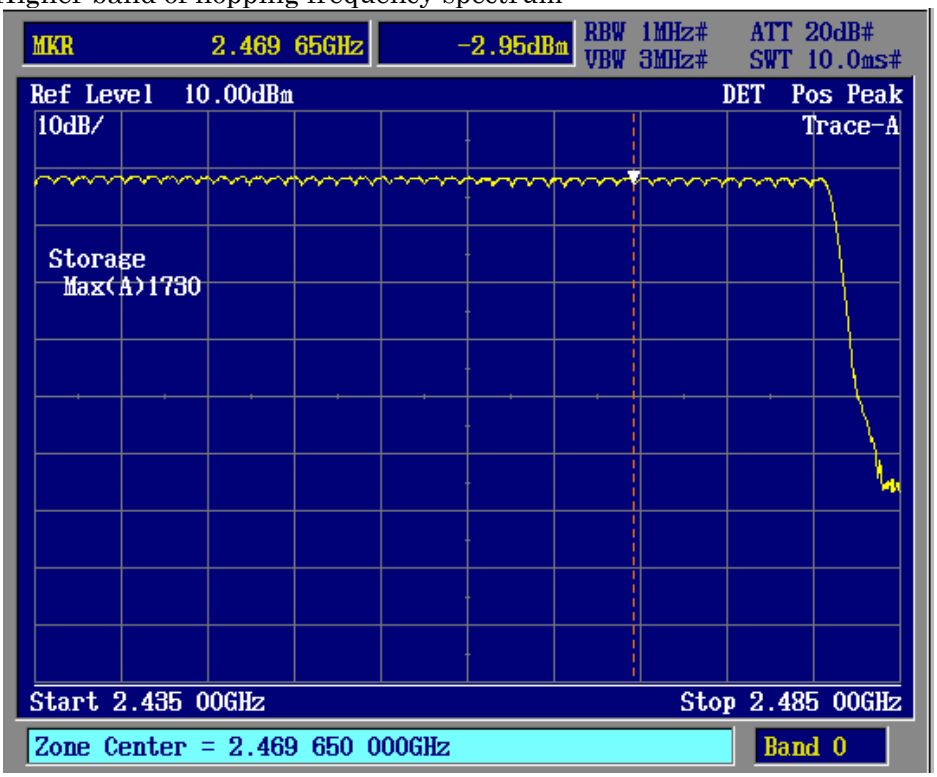
Uncertainty of measurement result: 1 usec
Temperature, Humidity : 23˚C, 45%

5.6.4 Measured Data

Lower band of hopping frequency spectrum

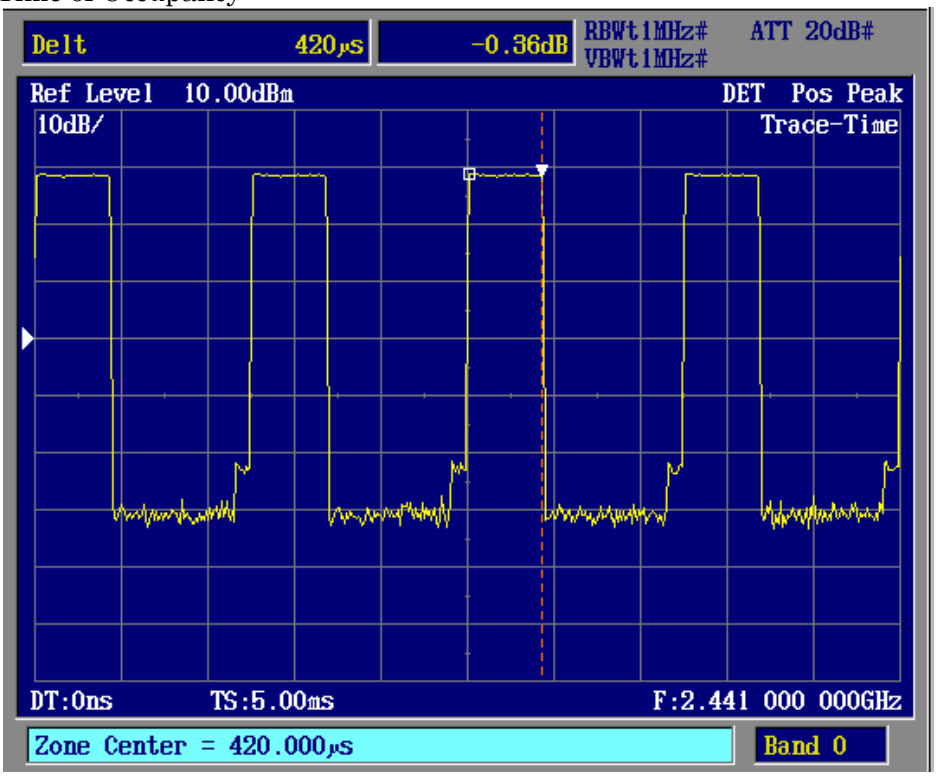


Higher band of hopping frequency spectrum



Number of observed channels	79

Time of Occupancy



Channel Hopping Rte:	1600 hops / sec
Number of channels:	79
Dwell time:	0.420 msec
Time of occupancy:	(1600 / 79) * 79 * 0.4 * 0.420 * 10^{-3} = 0.269 sec

5.7 15. 247(d) Band Edge Measurement

5.7.1 Setting Remarks

- The emission at the band edge is measured by using the marker function of spectrum analyzer.
- The peak of the in-band emission is measured by using the marker to peak function of spectrum analyzer.
- This measurement is repeated in both side of the spectrum.
- The spectrum analyzer is set-up as following;

✓	Resolution bandwidth	: Equal or less than 10% of frequency span
✓	Video bandwidth	: ≧ RBW
✓	Sweep	: Auto
✓	Detector function	: Peak
✓	Trace Mode	: Max Hold

- Where bandedge spectrum is too rough to find precise edge point, larger RBW i.e. 1MHz, 3MHz shall be applied as severer condition.
- See test configuration figure 4.4.

5.7.2 Minimum Standard

In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits. Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength limits:

Frequency of Emission (MHz)	Limit of the band edge spurious emission (dBμV)	
Below 2,390.0	Peak	Average
Above 2,483.5	74	54

5.7.3 Result

EUT complies with the requirement.

Temperature, Humidity : 23˚C, 45%

5.7.4 Measured Data

The band edge emissions are calculated as following;

Note: Angle 1~3 : Refer to page 51 and 52, Appendix A

(Angle 1)

Lower frequency 2,390 MHz

	Level (dBuV/m)
P_{max}	102.50
P_{av}	91.70
P_{dev}	52.12

	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
E_{be}	50.38	74.00	23.62
E_{av}	39.58	54.00	14.42

Higher frequency 2,483.5 MHz

	Level (dBuV/m)
P_{max}	102.10
P_{av}	91.40
P_{dev}	54.00

	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
E_{be}	48.10	74.00	25.90
E_{av}	37.40	54.00	16.60

P_{max} : Maximum peak power of the fundamental.
P_{dev} : The amplitude delta between the peak power and the band edge emission.
E_{be} : Band edge emission.
E_{av} : Average of the band edge emission.

(Angle 2)

Lower frequency 2,390 MHz (FH) Vertical

	Level (dBuV/m)
P_{max}	103.10
P_{av}	91.30
P_{dev}	52.27

	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
E_{be}	50.83	74.00	23.17
E_{av}	39.03	54.00	14.97

Higher frequency 2,483.5 MHz (FH) Vertical

	Level (dBuV/m)
P_{max}	101.50
P_{av}	91.00
P_{dev}	53.51

	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
E_{be}	47.99	74.00	26.01
E_{av}	37.49	54.00	16.51

P_{max} : Maximum peak power of the fundamental.
P_{dev} : The amplitude delta between the peak power and the band edge emission.
E_{be} : Band edge emission.
E_{av} : Average of the band edge emission.

(Angle 3)

Lower frequency 2,390 MHz (FH) Vertical

	Level (dBuV/m)
P_{max}	102.90
P_{av}	91.20
P_{dev}	53.09

	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
E_{be}	49.81	74.00	24.19
E_{av}	38.11	54.00	15.89

Higher frequency 2,483.5 MHz (FH) Vertical

	Level (dBuV/m)
P_{max}	101.80
P_{av}	91.10
P_{dev}	54.17

	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
E_{be}	47.63	74.00	26.37
E_{av}	36.93	54.00	17.07

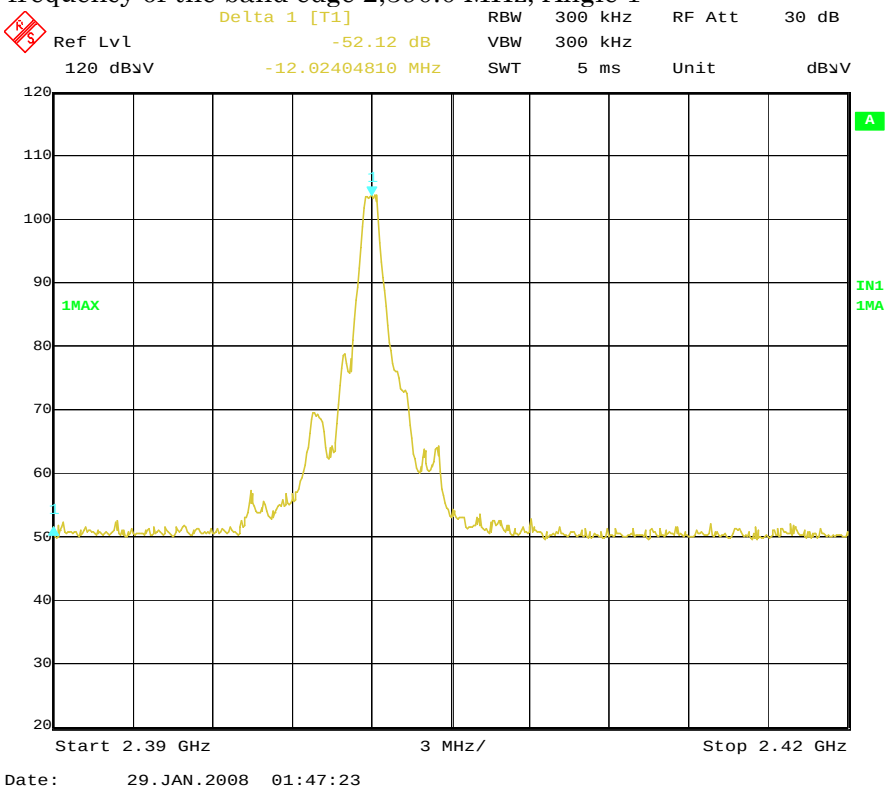
P_{max} : Maximum peak power of the fundamental.

P_{dev} : The amplitude delta between the peak power and the band edge emission.

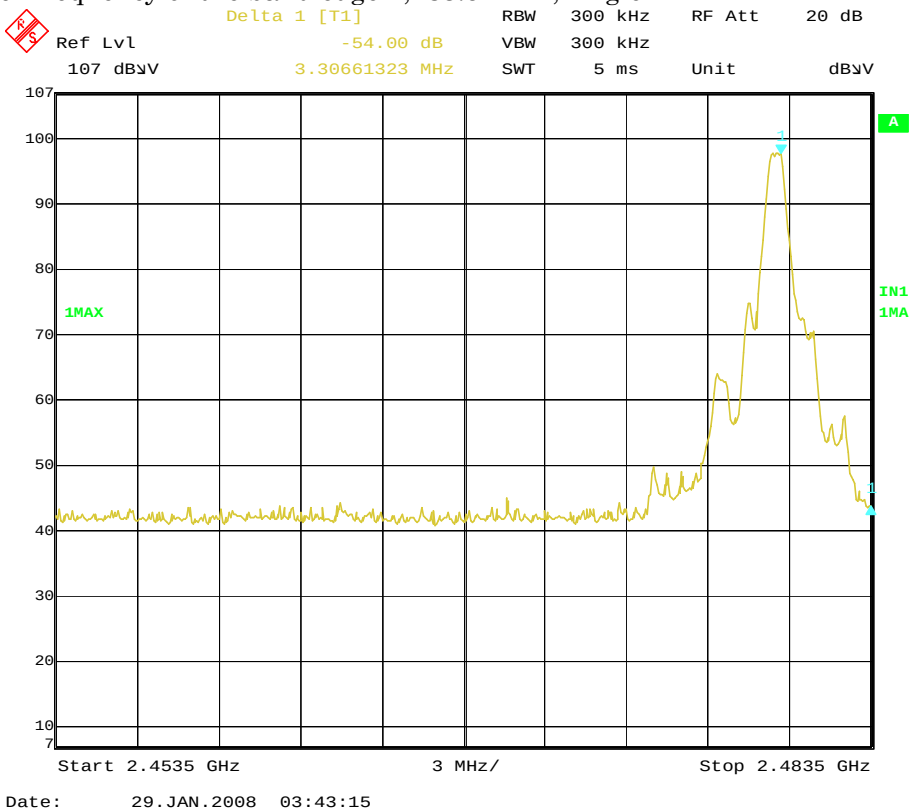
E_{be} : Band edge emission.

E_{av} : Average of the band edge emission.

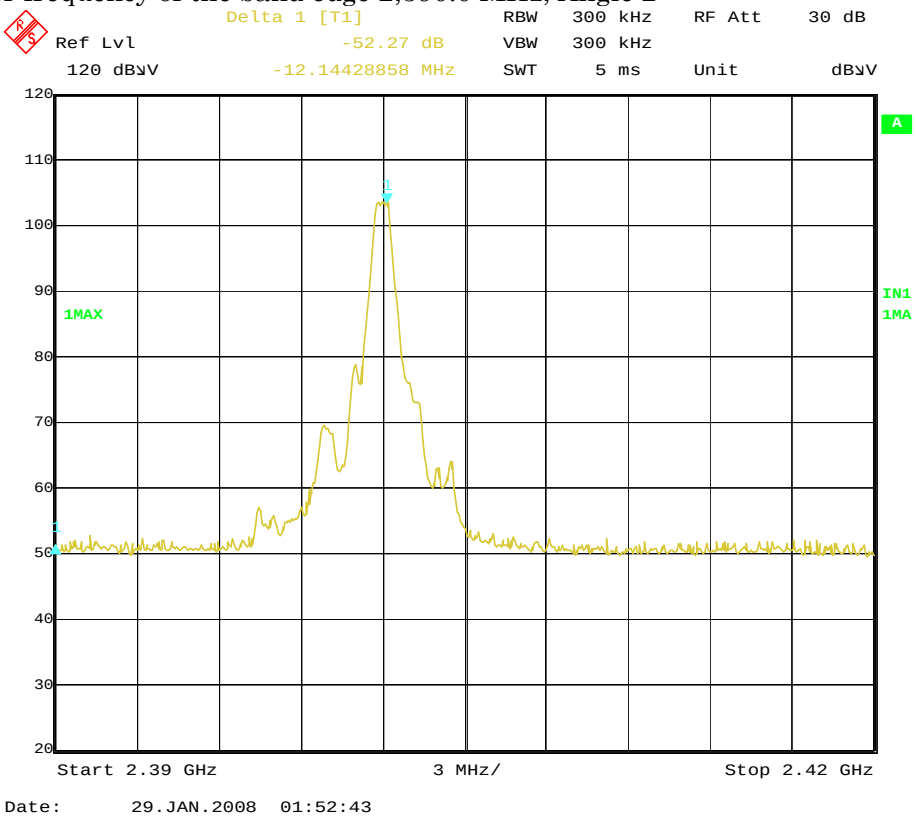
Lower frequency of the band edge 2,390.0 MHz, Angle 1



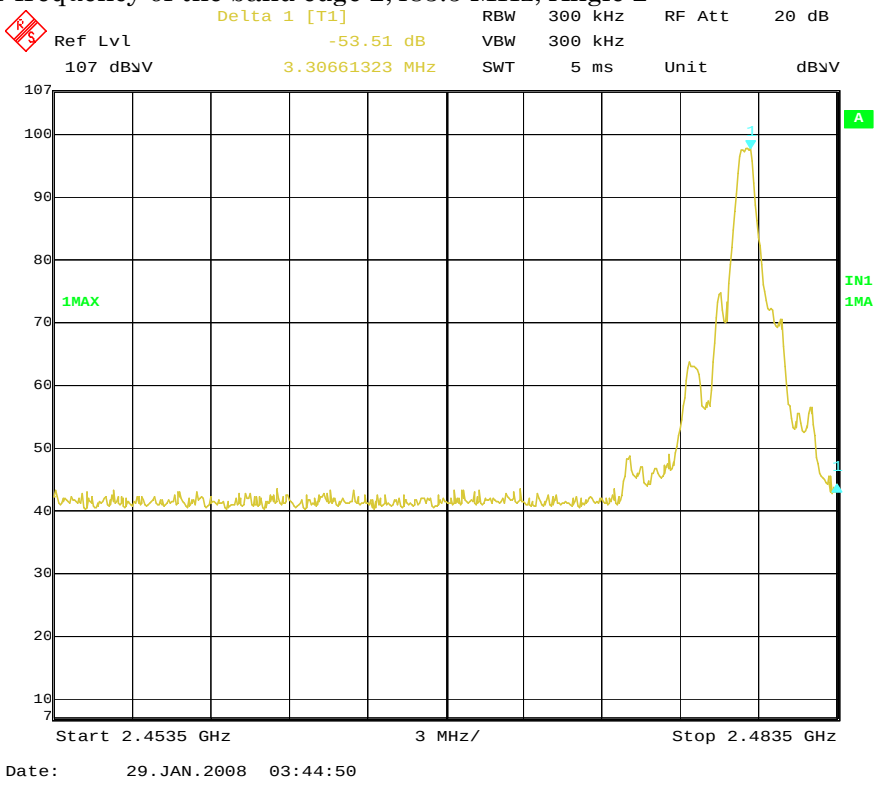
Higher frequency of the band edge 2,483.5 MHz, Angle 1



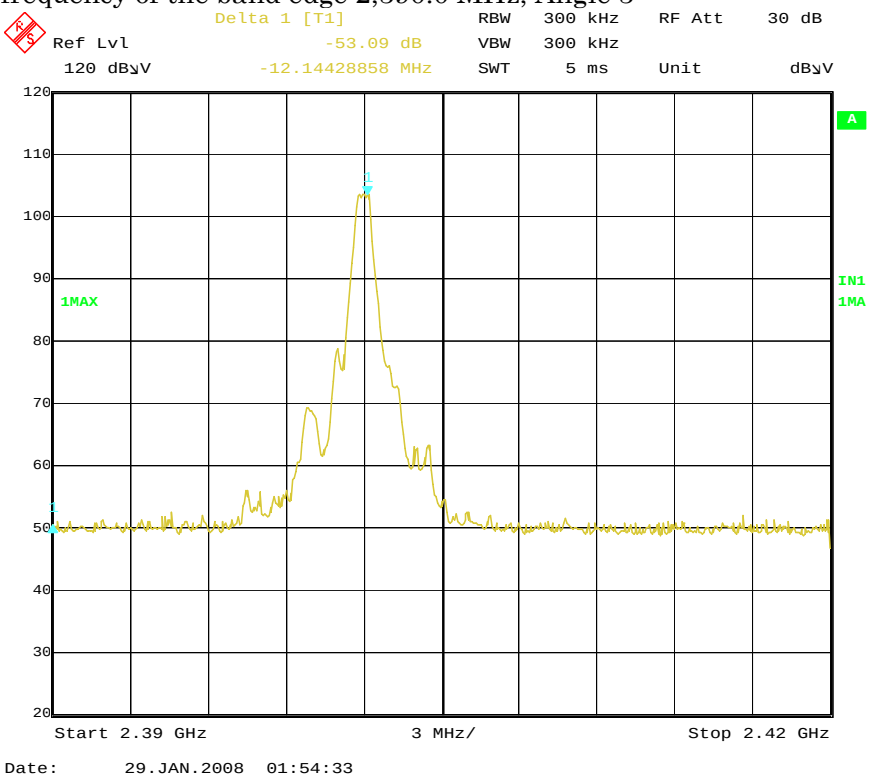
Lower frequency of the band edge 2,390.0 MHz, Angle 2



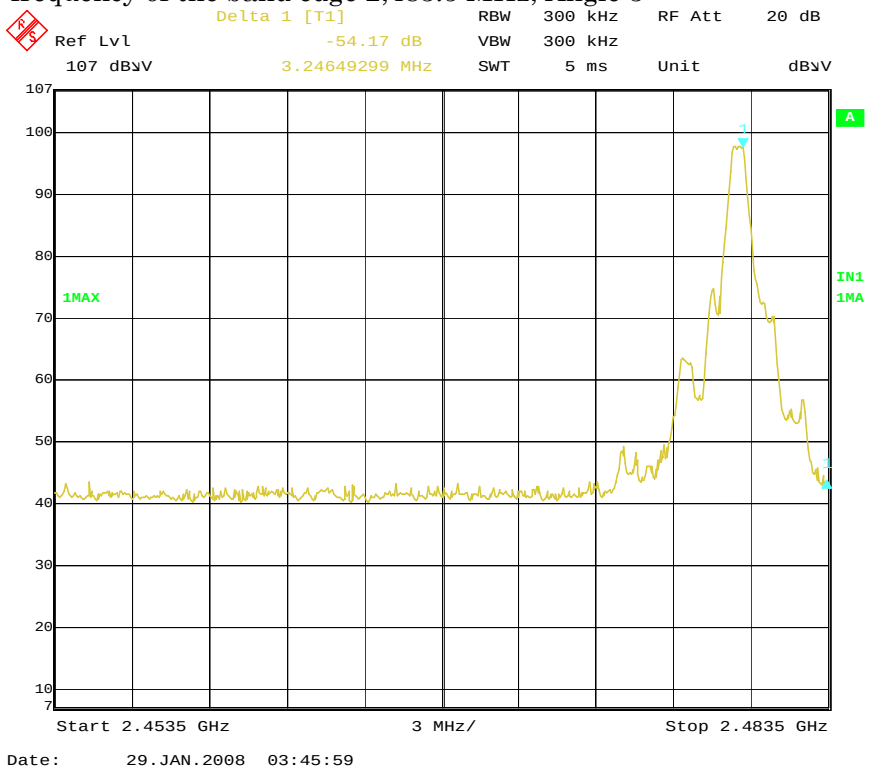
Higher frequency of the band edge 2,483.5 MHz, Angle 2



Lower frequency of the band edge 2,390.0 MHz, Angle 3

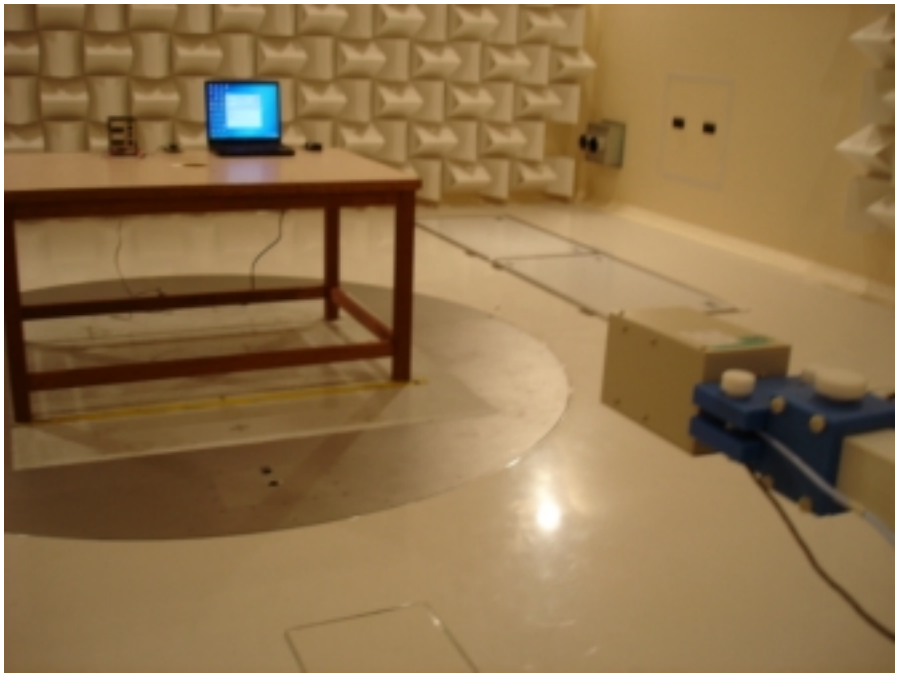


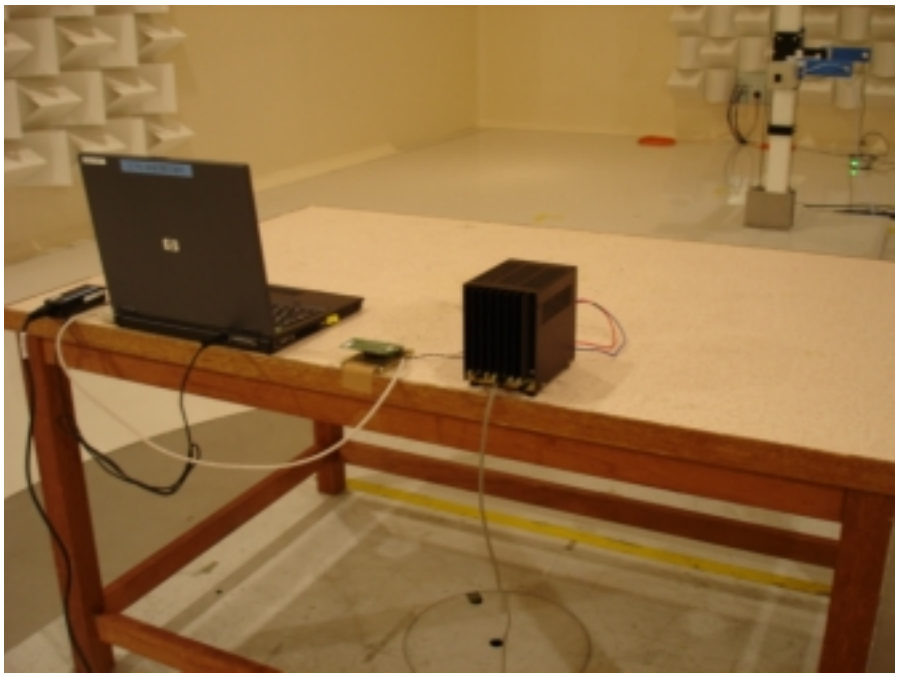
Higher frequency of the band edge 2,483.5 MHz, Angle 3



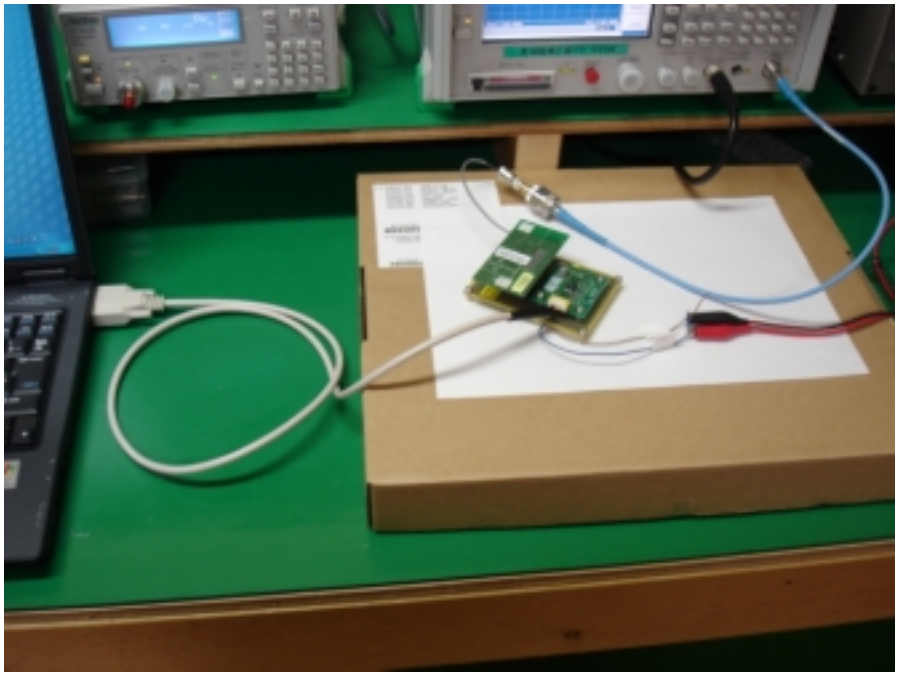
6. Photos

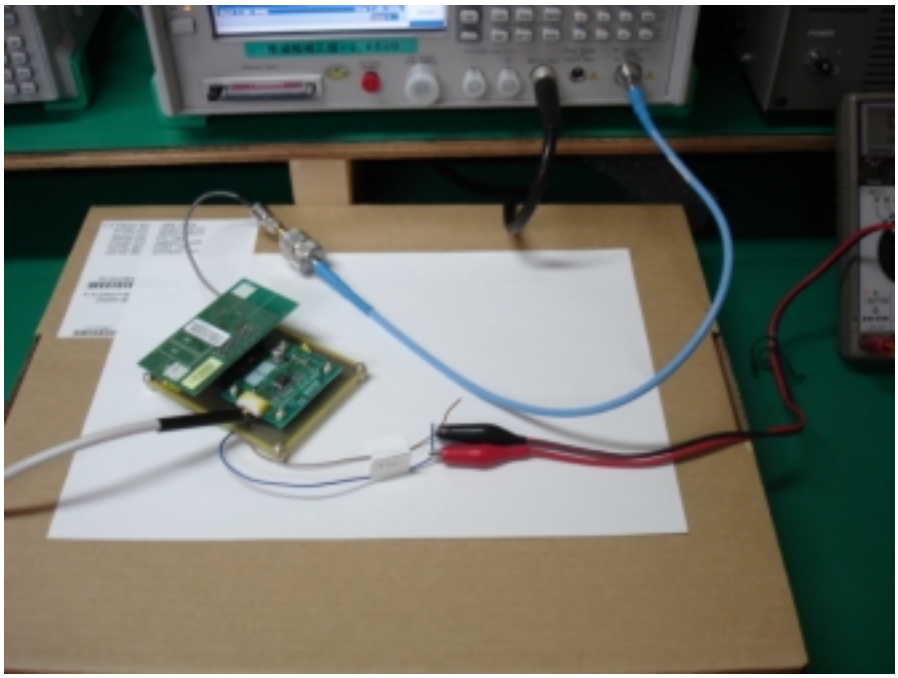
6.1 Setup Photo (Radiated Emission)



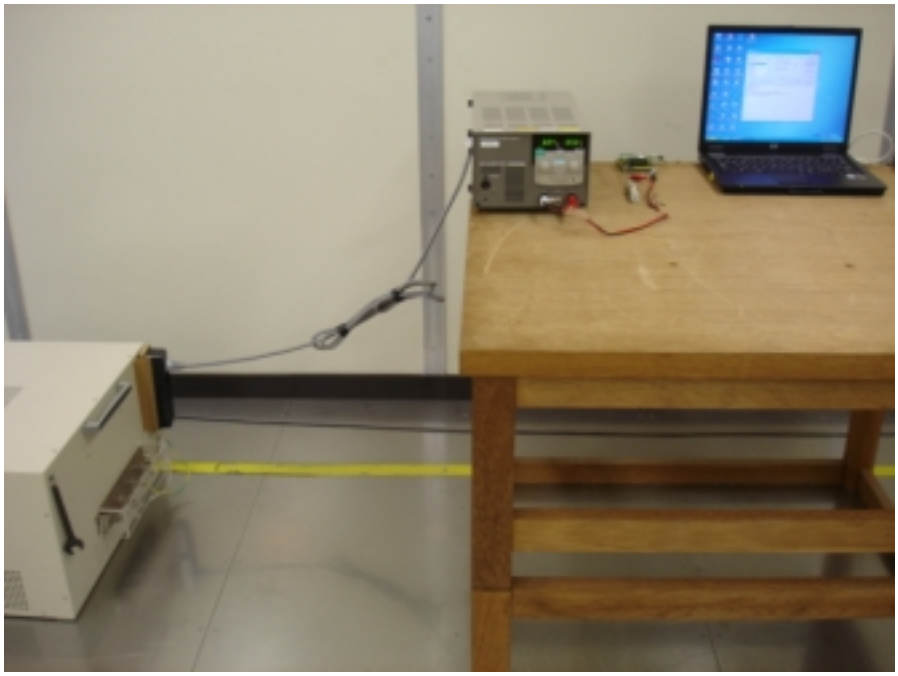


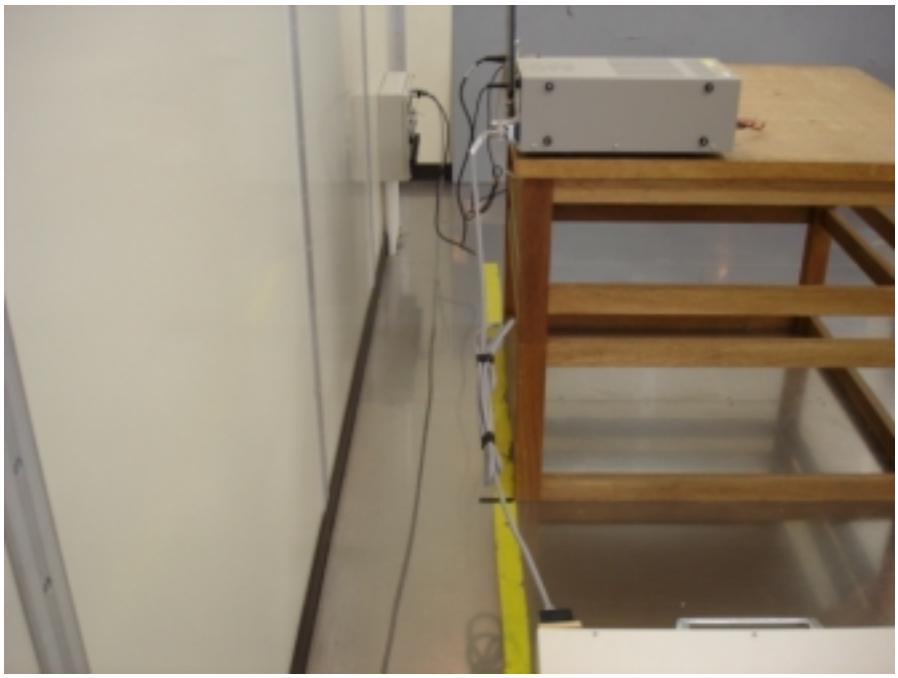
6.2 Setup Photo (All Other Test Item Setup)





6.3 Setup Photo (Conducted Emission)





7. List of Test Measurement Instruments

7.1 Conducted Emission Measurement

Instruments	Manufacturer	Model / Type	Serial No.	Calibration Date Next Calibration
Spectrum Analyzer	ADVANTEST CORPORATION	R3132	140501174	July, 2007 July, 2008
EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100335	May, 2007 May, 2008
Artificial-Mains Network	KYORITSU CORPORATION	KNW-341C (for EUT)	8-1659-1	September, 2007 September, 2008
Artificial-Mains Network	KYORITSU CORPORATION	KNW-244C (for Peripheral)	8-1657-1	September, 2007 September, 2008
Transient Limiter	AGILENT TECHNOLOGIES	11947A	3107A03745	July, 2007 July, 2008
RF Selector	Techno Science Japan Corp.	RFM-E221	3148	---

7.2 Radiated Emission Measurement

Instruments	Manufacturer	Model / Type	Serial No.	Calibration Date Next Calibration
Programmable AC/DC Power Source	NF Corporation	ES18000W	425779	---
EMI Test Receiver	ROHDE & SCHWARZ	ESIB40	100211	April, 2007 April, 2008
Biconical Antenna (30 to 300MHz)	SCHWARZBECK	VHBB9124(Balun) BBA9106(Elements)	311	September, 2007 September, 2008
Log.-Periodic Antenna (300 MHz to 1 GHz)	SCHWARZBECK	UHALP 9108 A	645	September, 2007 September, 2008
Horn Antenna	SCHWARZBECK	BBHA 9120 D	446	September, 2007 September, 2008
Horn Antenna	ETS LINDGREN	3160-08	00033778	September, 2007 September, 2008
Horn Antenna	ETS LINDGREN	3160-09	00034723	September, 2007 September, 2008
Pre-Amplifier	HEWLETT PACKARD	8447D OPT 010	2944A 07891	September, 2007 September, 2008
Pre-Amplifier (1 GHz to 18GHz)	HEWLETT PACKARD	8449B	3008A 01251	July, 2007 July, 2008
Pre-Amplifier (18 GHz to 26.5 GHz)	Techno Science Japan Corp.	MLA-1826POM-30	---	January, 2007 January, 2008

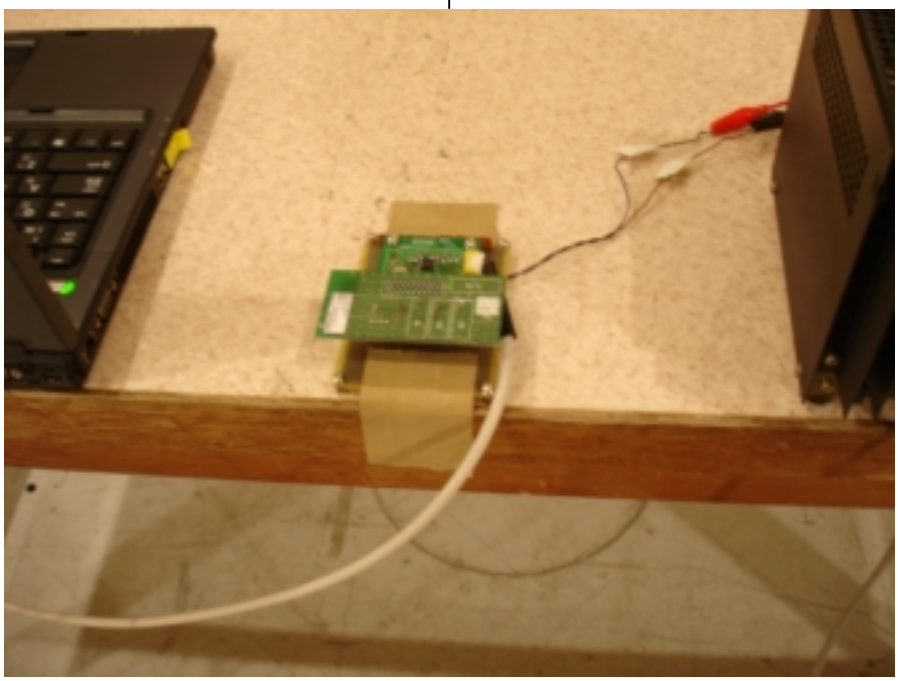
7.3 Conducted Radio Measurement

Instruments	Manufacturer	Model / Type	Serial No.	Calibration Date Next Calibration
DC Power Source	Diamond Antenna	GSV3000	01101481	---
Spectrum Analyzer	Anritsu	MS2687B	620016270 6	April, 2007 April, 2008
Signal Generator	Agilent Technology	E8254A	US411401 86	June, 2007 June, 2008
Oscilloscope	Tektronix	TDS794D	B031832	June, 2007 June, 2008
Diode Detector	Agilent Technology	423B	MY422418 36	March, 2007 March, 2008

Appendix A

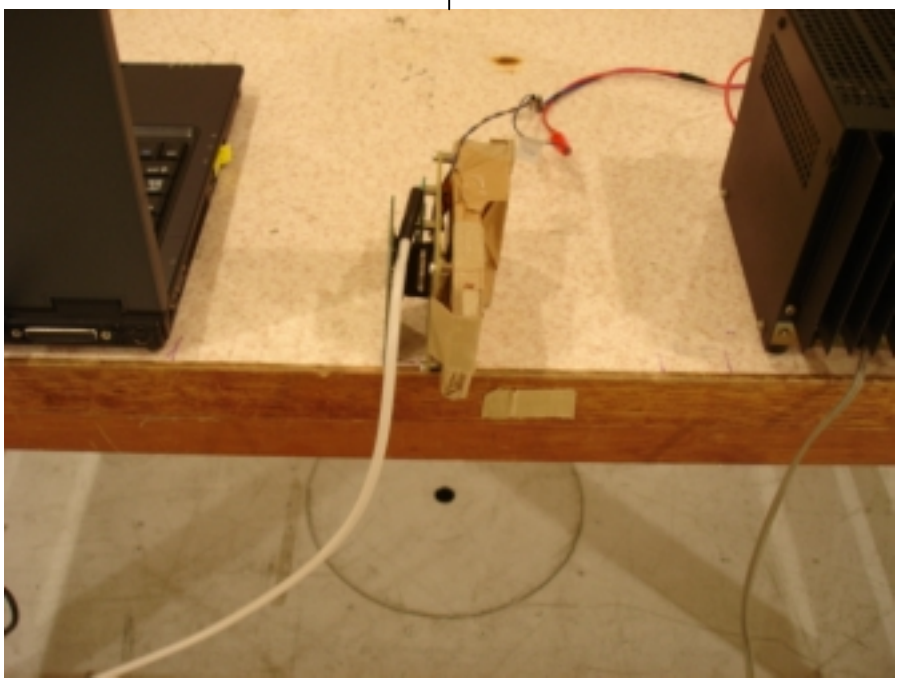
Angle 1

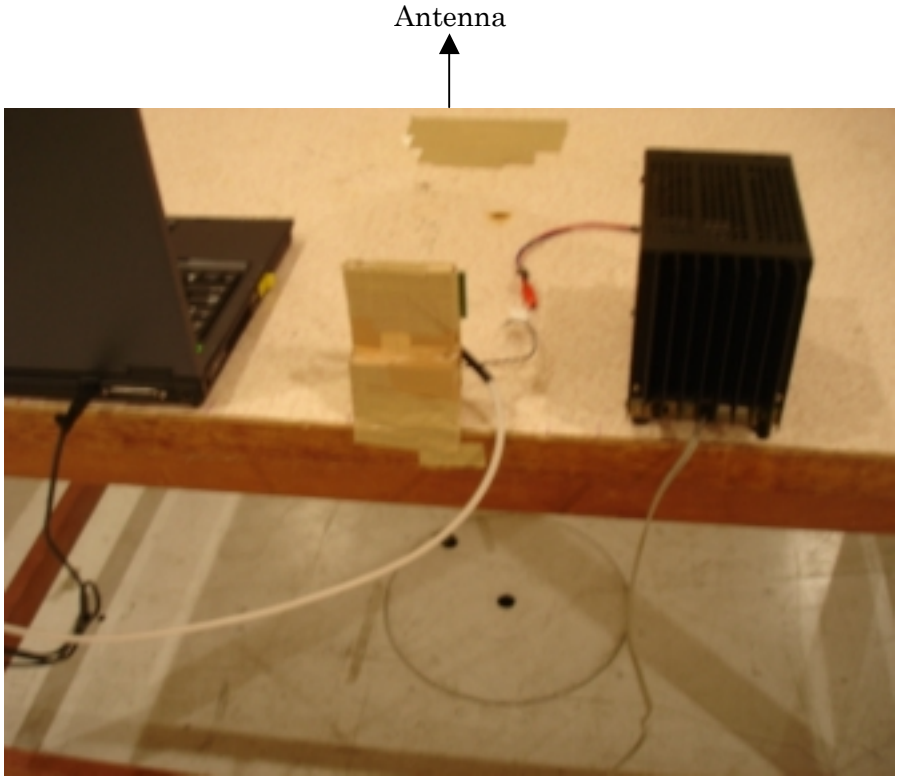
Antenna



Angle 2

Antenna



Appendix A (Continued)

Angle 3